Organizational aspects of clusters: continuity, promiscuity, competition

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Issues of strategic management:
STRATEGIC GRAMMAR

ORGANIZATIONAL ASPECTS OF CLUSTERS:
CONTINUITY, PROMISCUITY, COMPETITION

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LONG TERM RESEARCH PROGRAMME:
Environmental Analysis, corporate and business strategies,
and strategic networking in a changing European Community

Strategic Management is a set of managerial decisions and actions to help achieve corporate objectives that determine the long-run performance of a corporation in its relation to the company’s environment. The interdisciplinary nature of the field of strategic management is reflected in the wide range of academic disciplines of the staff members such as business administration, economics, political sciences, engineering sciences, psychology, and sociology. The research activities of the Department focus primarily on large and European-based international firms. The changing European environment, internationalisation processes, networking between firms and between firms and governments, as well as technological change are major and recurring themes in this research. In order to grasp the highly volatile reality behind these developments, research projects are conducted in a broad and interdisciplinary manner. The general research theme is elaborated along three lines of partly overlapping sub-themes, although each research theme builds on the other: (a) strategic grammar, (b) strategic choice and (c) strategic action. Each research theme builds on the other. More precise statements on the interaction and feedback between grammar, choice and action in the European context is the ultimate aim of this long term research programme.

(a) Strategic Grammar (on the boundaries of organizations).

The interface between strategic management and the business environment is the topic of this first line of research. In this research theme it is explicitly tried to integrate analytical concepts coming from the various disciplines. This implies also that the problems related to the integration of functional areas of management are considered. Important approaches are: the transaction cost and agency approach, bargaining and game theory, institutional economics, international regime analysis. Special attention is also given to the level of analysis problem. This is as much a methodological as a conceptual problem. By closely scrutinising the various concepts used in different approaches, it should be possible to decide upon the most appropriate concepts at one of the four levels of analysis: the (1) micro, (2) meso or industry level, (3) the national and (4) the international (EC) level. This line of research should contribute to the development of more or less coherent sets of research questions linked to concrete concepts.

(b) Strategic Choice (levels of network formation).

Strategic choice processes relate to the different network and institutional arrangements a company can engage in: mergers, acquisitions, strategic alliances, other forms of networking, interaction through open-market transactions. The concepts in this area of research have generally been aimed at deducing more empirically relevant concepts from the more abstract literature on grammar. A particular question posed at this level of analysis for instance is the “make, buy or cooperate” problem which is partly deduced from transaction cost and partly from networking approaches. A related problem refers to the “flexibility” of the networking company. As such the strategic level performs the function of an intermediary analytical level between grammar and action.

(c) Strategic Action (specific sector and topical studies).

This research theme entails the empirical studies that are intended to “prove” some of the approaches developed under the grammar or choice heading. The basic unit of analysis is the individual firm or a specific sector (cluster of related firms). Presently, the following topics are dealt with at the department: mergers and acquisitions, European policies, core technologies and core business, concrete bargaining over alliances, R&D policies, industrial policies, strategic flexibility of companies, trade policies, and subcontracting networks. Sectors that are covered include: the service industries, off-shore industry, pharmaceutical industry, the automotive industry, telecommunications, the electronics industry.
1 Introduction

The increasing role of interorganisational collaboration has been identified as one of the major trends in business today (Grandori, 1993). Firms that have developed a competence in building interorganisational structures may have a sustainable competitive advantage over those that don't. The rise of networks (Jarillo, 1988), regional conglomerations (Best, 1990), strategic alliances (Hamel, 1991) and other forms of interfirm cooperation is not just of relevance for business, but has also attracted attention from government. In this regard, Porter (1990), elaborating on his notion of related and supporting industries, has developed the concept of clusters of related firms and institutions. A national competitive advantage resides in the presence of such well-developed clusters, containing producers of primary goods, machinery, specialty inputs and services. In the Netherlands, the Ministry of Economic Affairs (1990) has taken clusters (defined by the Ministry as networks around a central firm, having extensive relationships with the "knowledge infrastructure" (universities, research institutions)) as a policy guideline. The aim of the Ministry is to forge/organizational links (both business-to-business and between business and research institutions) in order to create innovative and difficult to imitate clusters of multi-organizational relations in different sectors, which should form the basis of a national competitive advantage.

An example of such a cluster policy can be found in the way the Dutch government promotes R&D. Where formerly R&D subsidies were granted to individual companies, now the government has made a start with granting clusters of companies these subsidies. These clusters may for example include a producer, its client, and a university, which aim at jointly developing a new technology.

Even though different definitions of the cluster concept have been used, the emphasis has mostly been on geographically concentrated interfirm relations and their influence on technological innovation. In table 1 some cluster-definitions given by various authors have been assembled, in which geographical concentration and interfirm relations are in one form or another mentioned. The interfirm links which are identified in those definitions, differ from a rather narrow focus on networks with a central firm (Ministry of Economic Affairs, 1990) to a broad conception which may encompass all conceivable interfirm relations (Kusters and Minne, 1992; Nooteboom, 1993; VNO, 1993). In between lies Porter's view which is more related to traditional sectors (Porter, 1990).

The recency of the references given in table 1 might create the impression that the study of clustering is of a recent date. Yet, Marshall (1890, p. 328 and further) already pointed to the existence of "localized industries" or "industrial districts", which bear great resemblance to the cluster concept. They consist of regional concentrations of firms working within the same industry. His analysis of these localized industries makes Marshall a precursor of the modern scholars of the subject (Krugman (1991) acknowledges this intellectual debt).

It is widely accepted that clusters have an influence on technological innovation in two ways. Firstly, clusters are innovative: the relations between different firms and between firms and consumers enhance the development of new products, production processes and other technologies. Secondly, the diffusion of technological innovations is faster within clusters. The strong competition and swift dissemination of information in clusters, due to the advantages of geographical concentration of firms (Bartmess and Cerny, 1993), are the root causes of this effect. This effect was already known to
Marshall who stated: "Good work is rightly appreciated, inventions and improvements in machinery, in processes and the general organization of the business have their merits promptly discussed; if one man starts a new idea it is taken up by others and combined with suggestions of their own; and thus becomes the source of yet more new ideas" (Marshall, 1890, p. 332).

Table 1: Some definitions of clusters

<table>
<thead>
<tr>
<th>Author</th>
<th>Definition of Cluster</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ministry of Economic Affairs</td>
<td>Central firm in an innovative, preferably regionally concentrated network, linked to &quot;knowledge-infrastructure&quot;</td>
</tr>
<tr>
<td>(1990)</td>
<td></td>
</tr>
<tr>
<td>Kusters and Minne (1992, p.</td>
<td>&quot;Networks of relationships in an innovative environment, in which the influence of economies of scale and externalities is limited to a certain distance&quot;</td>
</tr>
<tr>
<td>62)</td>
<td></td>
</tr>
<tr>
<td>Nooteboom (1993)</td>
<td>Related constellations of technology, industry and services</td>
</tr>
<tr>
<td>Porter (1990, p. 287)</td>
<td>A collection of related, often regionally concentrated, industries in a sector, comprising producers of primary goods, machinery of production, specialty inputs, and associated services</td>
</tr>
<tr>
<td>VNO (1993, p. 15)</td>
<td>&quot;Dynamic and coherent networks of firms, knowledge centres and stimulating institutions, which supply each other, compete, cooperate and exchange information both formally and informally. These networks are anchored in the Dutch economy, produce high-quality products and services and have gained a strong and lasting international competitive position.&quot;</td>
</tr>
</tbody>
</table>

Source: Based on Jacobs (1993) and indicated literature; the quotes have been translated from Dutch by the author

In this paper the focus is not on the extensively researched effects of clusters on technological innovation; nor is it on the perhaps equally well studied advantages of geographical concentration. Instead it is on the relatively neglected field of the organizational aspects of clusters. The aim is two-fold:

- firstly, organizational aspects of clusters will be studied. The question here is how clusters are organized. What are the main organizational characteristics of clusters?

- secondly, the question will be discussed whether clusters enhance organizational innovation like they enhance technological innovation. Organizational innovation can be defined as a new way of coordinating activities, whether within or between firms, leading to a sustainable competitive advantage (a more precise definition can be found in Van den Bosch and De Man, 1993; the definition given here will suffice for this paper). The difference between organizational innovation and reorganization, is that a reorganization usually means that a known organizational form is implemented in a firm, whereas organizational innovation is a new of organizing. Examples of organizational innovations are the multidivisional form in the 1920's (Chandler, 1962) and the Toyota Just-in-Time system, which gradually developed in the decades after the Second Worldwar (Cusumano, 1988). Yet, many smaller and less wellknown innovations can be found as well.

As stated above, research in clusters has always been directed at the level of technological innovation. Recently some authors (a.o. Nelson, 1991; Kogut, 1991) have shown that organizational innovations can bring firms a longer lasting competitive advantage than technological innovation. The reason for this is that new organizational forms are more difficult to imitate than new technologies. Whereas new
technologies spread rather fast, new organizational forms can take decades to diffuse (see Kogut and Parkinson, 1993, for an excellent overview of the diffusion of the multidivisional form). The strategic importance of new organizational forms should therefore not be underestimated.

The quote from Marshall seems to suggest that clusters do have an impact on organizational innovation (if this is what Marshall meant by "general organization"), at least as far as the diffusion of them is concerned. As the present focus is on the emergence of organizational innovations, the diffusion question will not be subject to elaborate discussion. The way in which interfirm relations play a role in organizing production in a cluster will be discussed in section 2. This discussion will not only make clear that clusters consist of many different interorganizational relations, it will also lay the foundation for the discussion of the organizational innovativeness of clusters. Special attention will be given to the effect of long term interorganizational relationships on the emergence of new organizational forms in section 3.

2 Clusters: relevant organizational aspects

The most notable organizational feature of a cluster is the wide and pluriform range of interorganizational relations. From an organizational viewpoint clusters may be defined as geographically concentrated sets of relationships between organizations in a certain industry, where these relationships may have different goals and come in different forms. These organizations can range from public to private institutions, so the word "organizations" is used to denote a wide variety of institutions.

When looking at organizational aspects of clusters three types of interorganizational relationships can be distinguished. Foss and Eriksen (1994), drawing on game theory, distinguished between cooperative and non-cooperative relationships, depending on the fact whether firms work together in creating new resources and capabilities or whether they don't. Within cooperative relationships, some will be short term and others long term. Lorange and Roos (1992, p. 10) for instance point to the time for which a strategic alliance is formed as one of its basic characteristics. Some alliances are temporary, aimed at reaching a specific goal and once that is reached the alliance is dissolved. Other alliances aim at a relation for the long term and do not have a specified lifetime or a goal, the fulfillment of which entails the obsolescence of the alliance.

Hence, there are 3 interorganizational relationships in clusters (table 2):

1. Long term relationships
2. Short term relationships
3. Non-cooperative relationships.

<table>
<thead>
<tr>
<th>Table 2: Interorganizational relationships in clusters</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cooperative</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Non-cooperative</td>
</tr>
</tbody>
</table>

The first kind of relationships will be dealt with most extensively, because they are especially characteristic of clusters. They include various kinds of coalitions, and are closely related to Porter's "related and supporting industries". The word "long term" refers to the ongoing character of the interaction between these related and supporting industries. Short term and non-cooperative
relationships will be analysed less elaborately. The perspective taken here is a rather broad one. That is, it is mainly relevant for the broadly defined cluster concept of Porter (1990) and Kusters and Minne (1992). An encompassing analysis of interfirm relationships in a network with a core firm (more similar to the cluster definition of the Ministry of Economic Affairs (1990)) can be found in Ruigrok and Van Tulder (1993). Their analysis of "industrial complexes" (p. 138) is of special interest for the detailed description of dependency relationships between firms.

Long-term relationships: continuity

In clusters an important role is played by long-term relationships between firms, which could be called "coalitions". The key characteristics of coalitions are that they are of strategic importance (long term), there is equality in the relationship (no party dominates) and the firms are intertwined (have extensive relations).

Porter and Fuller (1986) made a distinction between coalitions across the borders of activities (X-coalitions) and coalitions within activities (Y-coalitions). "In X-coalitions, firms divide the activities between themselves (for example, one partner manufactures while letting the other market). In Y-coalitions, the firms share the actual performance of one or more value activities (for example, a joint marketing agreement)" (p. 336). Dussauge, Garrette and Tenenhaus (1992, p. 7-9) attach great weight to this distinction for strategic alliances and Lei and Slocum (1991) make this distinction as well. The unfortunate names of X and Y can be replaced by Lei and Slocum's (1991) terms of specialization and shared ventures, respectively.

Extending the Porter and Fuller framework, not only the form (specialized or shared) of the coalition is of interest, but also the goal. The activities to be performed by the coalition can be new for the partners (innovation-coalition) or existing, in which case the goal of the coalition is improving the performance of these activities (rationalization). In terms of Porter (1990) and Schumpeter (1942): some coalitions aim at static efficiency, others at dynamic improvement (for a discussion of these concepts and their importance for firm strategy and governmental policy see De Man (forthcoming)).

The result of this classification is given in table 3, in which four kinds of coalitions are identified: specialized-rationalisation, specialized-innovation, shared-rationalization, shared-innovation. The precise organizational form of every coalition is of course determined by the nature of the linkages between the parties. Each of these coalitions may have strong or weak linkages between the partners (Lorange and Roos, 1992, p. 11). Here however the object is to show the pluriformity of interorganizational relations in a cluster and the current discussion suffices for that.

Table 3: Typology of Long Term Interorganizational Relationships (coalitions), goal and form

<table>
<thead>
<tr>
<th></th>
<th>Specialization (X)</th>
<th>Shared (Y)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rationalization</td>
<td>specialized rationalisation</td>
<td>shared rationalisation</td>
</tr>
<tr>
<td>(existing activities)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation</td>
<td>specialized innovation</td>
<td>shared innovation</td>
</tr>
<tr>
<td>(new activities)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Some examples of the forms defined in table 3 are listed below:

- specialized rationalisation: long term subcontracting relationships. In subcontracting the subcontracting firm usually eliminates an activity from his value chain. In this relationship no new activity is created and normally the reason for subcontracting is that this activity can be done more
efficiently by another producer. Therefore, buyer-supplier relationships are usually specialized rationalisation coalitions.

- in shared rationalisation firms perform an already existing activity together, for example to reap economies of scale or scope. An example of such a coalition is combined purchasing.

- Lorange and Roos (1992, p. 48) give an example of specialized innovation. When parties attempt to enter a new market together, and one firm in the coalition brings in knowledge of a market and another brings in technological know-how, this is a specialized innovation coalition. Another example can be found in aircraft manufacturing where the development of a new plane is divided between different firms: one makes the wing, another one the engine, a third one provides assembly and marketing.

- shared innovation is present when two firms develop a new technology together or when as in the case of marketing consortia in the Third Italy (Best, 1990), a coalition is formed that performs an activity that individual firms cannot or did not perform themselves. In this case individual firms were too small to do marketing themselves, so they decided to cooperate.

Of course this classification of coalitions sketches an idealized picture. Many coalitions require more than one activity to be brought in and also there will not be many coalitions that concentrate entirely on known activities or on completely new ones. It can for instance also be the case that the activity performed by the coalition is new to only one of the partners. Nevertheless the typology of table 3 can be helpful in gaining insight into the dynamics of coalitions and clusters.

An illustration of this is given in table 4, where some differences between specialization, sharing, rationalisation and innovation coalitions are discussed. Every form of coalition distinguished in table 3 has its own dynamics. The hypothesis can be advanced that a mix of coalitions at the cluster level may enhance the dynamics of the cluster in terms of innovativeness, the speed and direction of information dissemination etc. and thus contribute to its competitive advantage. This diversity may even be one of the key reasons for a cluster's success. In Nelson's words (Nelson, 1991, p. 72) the different forms of coalitions are a variety of routines on which economic progress depends.

Moreover, a balance between dynamic improvement and static efficiency can be maintained by individual firms by making intelligent use of combinations of different forms of coalitions. Firms can on the one hand realize static efficiency, by entering into rationalisation alliances. On the other hand dynamic improvement can be achieved by entering into innovation alliances. Coalitions can therefore play a role in relieving the tension between efficiency and innovation, which was pointed at by Schumpeter (1942). Also, as Geroski (1992, p. 143) pointed out for the case of joint ventures, coalitions make it possible for firms to pursue multiple research projects simultaneously.

One important proviso is that the organizational skills required to manage such interorganizational relationships are considerable. Firms possessing them may have an important competitive advantage. Firms not possessing them and entering into a coalition may undermine their competitive positions. Reich and Mankin (1986) issue a warning in this respect, so do Porter (1990) and Hamel (1991) (see table 4) and Commandeur (1994, p. 100) who provides an overview of drawbacks of cooperation.

One of the organizational aspects of clusters, then, is elaborate coalition formation. Organizations are geared to one another and their activities often are intertwined. Firms can be linked to other firms at all possible stages in the value chain. In these advanced coalitions there often is equality in the relationship between firms, as firms in long term relationships are often mutually dependent. It is this equality that according to VNO (1993) distinguishes mature clusters from developing concentrations of firms. In section 3 the organizational innovativeness of these long term relationships will be under scrutiny. It will be shown that it is reasonable to assume that these relationships form an inhibiting factor for organizational innovation.
Table 4: Some differences between the different forms of coalitions identified in table 3

<table>
<thead>
<tr>
<th>- strategic objective</th>
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<tbody>
<tr>
<td>The different coalitions may have different objectives. Rationalization coalitions will probably be directed at enhancing efficiency, whereas innovation coalitions will generally be directed at learning new capabilities or developing new products. Shan and Hamilton's (1991) research on international strategic alliances is mainly concerned with the latter. X-coalitions also differ from Y-coalitions in the amount of control the partners have over different activities, as in X-coalitions there is no control over the activity performed by the other partner.</td>
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<tr>
<th>- dependency among partners/coalition stability</th>
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<tr>
<td>In X-coalitions partners are more dependent on each other, because each partner concentrates on one activity. If one of the partners does not fulfill its promises, the other partner cannot easily switch to doing the lacking activity himself. In Y-coalitions this dependency is probably less, because in case of default of one of the partners there is a possibility for the other partner to provide the lacking activity himself. An elaborate analysis of dependency in strategic alliances can be found in Ruigrok and Van Tulder (1993). Regarding stability, Harrigan (1988) claims that ventures last longer when their activities are performed by both partners (Y-coalitions).</td>
</tr>
</tbody>
</table>

<table>
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<tr>
<th>- the amount of discretion of the coalition</th>
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<tr>
<td>When the coalition is a separate entity, there may be differences in its independence from its founders. When coalitions are created to perform new activities (innovation) the discretion of the coalition may be high, as the founding partners because of lack of knowledge of the activities performed in the coalition, are less able to control it. If however both partners are familiar with the production process performed by the coalition, this may limit the coalition's independence, because the possibilities for parental control are high.</td>
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</tbody>
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<table>
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<tr>
<th>- possibility to limit access to proprietary knowledge</th>
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<tr>
<td>Hamel (1991) seems to suggest that in X-coalitions proprietary knowledge can be protected better than in Y-coalitions. Yet much depends on the kind of activities involved. Hamel gives an example where one firm brings in manufacturing competence and another marketing experience and product designs: &quot;the partner contributing production skills seemed to benefit from an inherently lower level of transparency. For while it did not appear that a firm could transfer product designs to its partner without revealing, perhaps inadvertently, a great deal of implicit market information, it was possible for the producing partner to ship back finished products without revealing much of what comprised its manufacturing competence.&quot; (p. 95).</td>
</tr>
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<table>
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<tr>
<th>- learning abilities</th>
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<tr>
<td>In general the issues brought forward by value chain analysis as far as learning is concerned, can be said to deal with the problem of transparency (Hamel, 1991). That is, they are concerned with the potential for learning. It can be suggested that rationalisation coalitions have more limited possibilities for learning than innovation coalitions, because they actually reduce a company's capabilities by reducing the number of activities performed in the firm itself. Indeed, Porter (1990) and Hamel (1991, p. 92) pointed to some dangers inherent in especially X-rationalization coalitions. It can happen that firms remove certain activities from their value chain because their partner performs these activities better, instead of trying to catch up by means of learning. This may lead to an erosion of a firm's competitive position.</td>
</tr>
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</table>
Short term relationships: promiscuity

Next to long term relationships in coalitions, there are various short term relationships in clusters as well. These can consist of simple deliveries, the provision of less important parts for the manufacturing of a good, the use of management consultancy etc. In these relationships there can be a lot of dynamism: firms can for instance make use of different suppliers and may shift supplier often. The fact that there is no certainty in short term relationships for a supplier that he can continue to deliver goods in the future, is a strong impetus for him to deliver quality at reasonable cost and thereby contribute to the competitive advantage of its client and the cluster.

These promiscuous forms of collaboration are important in maintaining the overall efficiency of the cluster, but will seldom lead to important innovatory technological breakthroughs. This is so, because these may require long term interaction between cooperating firms or even investment in dedicated assets that firms will not be liable to make when the possibility of establishing a long term relationship is limited. Another characteristic of these short term collaborative relationships is that they usually are unequal: that is one party is clearly dominant.

The organizational innovativeness of this kind of relationships is unclear. As these relationships will be more competitive than long term relationships, they may stimulate organizational innovation. The competition in these short term relationships may lie in the bargaining power of the suppliers (one of the five competitive forces of Porter (1980)). The attempts of suppliers to get some of the surplus of the client is a form of competition. Next, compared to the equality in long term relationships, the inequality in short term relationships will be easier to handle in organizational innovation. It gives an innovative firm some room for manoeuvering e.g. by dictating change.

On the other hand, the presence of short term interorganizational relationships may inhibit organizational innovation for some of the same reasons as in the case of long term relations (see section 3). Despite the inequality pointed at above and despite the fact that the relations are only for the short term, the upheaval caused by implementing a new organizational form may still be prohibitive. For example, partners may have to change as well, which is an extra barrier to surmount. The influence of a network of short term relations on organizational innovation is therefore unclear.

Non-cooperative relationships: competition

A third feature of clusters is of interest. Organizing clusters does not necessarily mean that there has to be a deliberate coordination of firm activities in which the firms are in actual contact with each other. Coordination by means of other non-deliberate and non-cooperative mechanisms can play a role as well. Non-cooperative relationships do not require considerable interaction between firms (the communication of price may often be sufficient), but may be enhanced by the geographical concentration of a cluster.

One example of this lies in externalities. First of all the presence of a large group of firms in a similar industry can give rise to the growth of supporting industries or specific resources with which no direct relation has to be maintained, but of which the advantages are nevertheless clear. Specialized schools can be an example of that and dedicated infrastructure is another one. These things can contribute to the organization of production in a cluster, without the involvement of individual firms.

Next to these externalities which will usually be provided by a government, externalities created by the firms themselves may also play a role. Rules of conduct in an industry for instance can develop without cooperation, and still act to organize the industry (Foss and Eriksen, 1994). Other examples include knowledge spill-over, benefits of standardization and employees changing companies. The culture of the region in which the cluster is based may also act to coordinate interactions in the cluster. This coordination by means of non-cooperative relations may not seem to be specifically organizational, but in fact does play a role in the organization of production in clusters and has been claimed to be central to the spatial organization of production. Indeed these elements of what may be
called "non-deliberate" or "non-planned" (Foss and Eriksen, 1994) organization have often been claimed to be of great importance. Deliberate attempts to reap the benefits of such externalities can be found in the fashion of creating parks for related firms (industrial parks, science parks, Distriparks etc.).

The hypothesis can be advanced that competition stimulates innovation. Nelson (1991) for example, claims that monopoly and oligopoly are unlikely to generate innovations. As the competitive element in non-cooperative relationships is considerable and may even be enhanced by the geographical concentration of firms, they will, if this hypothesis on competition holds, enhance organizational innovation. Moreover, when firms are regionally concentrated, they tend to have similar inputs. The more similar the inputs into the production process, the more competing firms will try to distinguish themselves from each other by means of innovation (Best, 1990).

Table 5: Organizational aspects of clusters

<table>
<thead>
<tr>
<th>Relationship</th>
<th>Characteristic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long term</td>
<td>- intertwined: elaborate coalition formation on key parts of production process</td>
</tr>
<tr>
<td></td>
<td>- equality and continuity in the relationship</td>
</tr>
<tr>
<td></td>
<td>- limit organizational innovation (see 3)</td>
</tr>
<tr>
<td>Short term</td>
<td>- dynamism</td>
</tr>
<tr>
<td></td>
<td>- inequality and discontinuity in relationships</td>
</tr>
<tr>
<td></td>
<td>- effect on organizational innovation uncertain</td>
</tr>
<tr>
<td>Non-cooperative</td>
<td>- coordination by price, employees changing companies, rules of conduct, knowledge spill-over, regional culture etc.</td>
</tr>
<tr>
<td></td>
<td>- competitive, and thereby innovation enhancing</td>
</tr>
</tbody>
</table>

Table 5 summarizes the organizational aspects of clusters along the specified dimensions of long term, short term and non-cooperative relationships. As has been pointed out in the previous section, especially the presence of elaborate coalition formation or related and supporting industries, is seen as an impetus for technological innovation. The equality in these relationships is one of the key characteristics of mature clusters as opposed to developing clusters (VNO, 1993), and therefore merit specific attention when organizational innovation aspects of clusters are studied. For these reasons the next section will focus on these long term relationships. It will be shown that though the level of technological innovation may be high in these kind of coalitions, their organizational innovativeness may be lower.

3 Organizational innovativeness of long term relationships

The previous section has shown that long term interfirm organizational relations are of great relevance in clusters. In this section evidence will be reviewed to support the hypothesis that long term relationships work against organizational innovation.

Long term relationships have been identified as technologically innovative, but from an organizational viewpoint embeddedness in a network of interorganizational relations may have some drawbacks. In literature on networks for instance, the proposition has been advanced that organizational change in networks is unlikely to occur and that networks display a strong tendency towards inertia (see e.g. Grabher, 1993). In this regard Tushman and Romanelli (1990, p. 145), whose description of a network is equivalent to Porter's (1990) definition of clusters, observe:
"As webs of interdependent relationships with buyers, suppliers and financial backers strengthen, and as commitments to internal participants and external evaluating agents are elaborated into institutionalized patterns of culture, norms, and ideologies; the organization develops inertia, a resistance to all but incremental change."

Similarly, Håkansson and Johanson (1992, p. 34) state:

"Changes of the network must be accepted by at least large parts of the network. Therefore all changes will be marginal and closely related to the past."

As organizational innovation is a subcategory of change, it is interesting to look at the reasons which have been provided to support the claim of limited change in networks and see if these claims also apply to organizational innovation in firms with long term interorganizational relationships. It will be especially interesting to see whether in the case of organizational innovation (change towards a new way of organizing), these reasons are of more importance than in the case of "normal" organizational change (change to known or standard ways of operating). Table 6 gives an overview of factors inhibiting change in long term interorganizational relationships, which will be discussed now.

Table 6: Some factors inhibiting change in long term interorganizational relationships

| - Lock-in because of externalities  
  (Håkansson and Johanson, 1992) |
| - Absence of a hierarchy  
  (Best, 1990) |
| - Entrenched routines because of:  
  - Isomorphic pressures  
    (DiMaggio and Powell, 1983)  
  - Pressures towards inertia  
    (Hannan and Freeman, 1977) |

Externalities

First of all organizational innovation inside a company can be effected by the presence of related and supporting industries. Intra-organizational innovation can be limited, because the implementation of a new organizational form may have consequences for organizations outside the innovating firm. When for instance a firm wants to change its production process, this may require its suppliers to change their way of working as well. Håkansson and Johanson (1992, p. 31) formulate this effect as an externality "...changes are associated with costs of adjustment which are not, however, necessarily born by those performing the activities". The more a firm is embedded in a web of coalitions, the more interfirm linkages between activities there are, and the sooner this effect of lock-in because of externalities will occur. As intertwinedness was one of the characteristics of long term organizational relationships, this point is of particular interest in this case.

Related to the previous point, the relationship between firms in a coalition can become more difficult to change, because more than one firm is involved. A change in the linkages between firms, does not only require a change of routine in cooperating, but often also a change of routine in the cooperating firms themselves. As hierarchies are difficult to change (Williamson, 1975; Mariotti and Cainerca, 1986), a change in a relationship between two hierarchies may not be easy to accomplish.
Absence of a hierarchy

In addition Best (1990, p. 206-207) points to the fact that when clusters have come to full development and a considerable equality among the constituent firms of the cluster is present (as in the case of the Third Italy), it will be hard for a cluster to restructure itself. The absence of a managerial hierarchy which is able to design, guide, coordinate, or even dictate interorganizational change, may be prohibitive in this regard. Daft (1978, p. 206) already found that high centralization was a requirement for implementing organizational innovations. As in many coalitions there is no central authority, change may be a difficult process. Powell (1990, p. 305) points to a similar idea, namely that with increasing dependency of firms in networks, firms loose the ability to dictate their own future. This loss of control is not compensated for by the existence of a managerial hierarchy: no single firm or person can act as an independent change agent in such egalitarian networks. These observations are of particular relevance in long term relationships as in these relationships there often is a considerable degree of equality between partners (see table 5).

The consortia in the Third Italy (Best, 1990), provide an example of an organizational innovation in egalitarian relationships. The reasons why they have come into being are also pointed at by Best. These are government intervention, intense competition, lack of resources of individual firms to do the activities performed by the consortia themselves and the will to maintain capabilities which could not have been maintained when activities would have been subcontracted (see Best, 1990, chapter 7). What this means, is that the absence of a hierarchy in egalitarian networks does not eliminate the possibility for organizational innovation. Instead, it is just one of the counteracting forces. Other forces, both in the business environment and inside firms may tip the balance the other way.

Isomorphism

In non-egalitarian networks, Buchko (1992) found a similar negative effect on organizational innovation for different reasons than in egalitarian networks. Building on DiMaggio and Powell (1983), Buchko shows the role institutional isomorphism plays in limiting the possibility for strategic transformation of networks. He states that in networks with a strong central organization (which may be buyers, suppliers, governmental institutions) on which other firms are dependent the scope for strategic transformation, is limited because there are strong pressures for conformity to the rules of the central firm. These pressures from central firms, are an example of coercive isomorphism.

The other form of isomorphism, identified by DiMaggio and Powell (1983) that, according to Buchko, is of interest in interorganizational relations is normative isomorphism (third form of isomorphism, mimetic isomorphism, is not discussed by Buchko). The development of a network and increasing formalization of relationships create a way of working in a network that may become the standard way of operating. "As firms within an organizational network interact with one another, over time there develop specific mechanisms for the coordination of activities among firms within the network" (Buchko, 1992, p. 11) and "...to the extent that such linkages are codified, formalized, or form the taken-for-granted assumptions of a complex interfirm network, organizations will experience increased pressure for conformity and higher barriers to transformation" (Buchko, 1992, p. 23). So linkages between activities of different firms may become a powerful force for conformity and isomorphism and prevent firms from engaging in alternative activities that may be seen as outside the norms of conduct. As innovation by definition is a change away from established norms and away from isomorphism, the conformitive pressures (grounded in historically developed routines of cooperation) to be overcome by an innovation can be substantial.

This latter historical constraint on change has also been defined by Hannan and Freeman (1977), in their discussion of inertia and bears a strong resemblance to Nelson and Winter's double-edged concept of routines: the history of firms on the one hand provides a justification of the present way of working and on the other hand precludes a consideration of alternative ways of working (Hannan and Freeman, 1977, p. 931). Whereas Hannan and Freeman identify this mechanism on an intra-organizational basis, Buchko (1992) applies it to inter-organizational relations as well.
This phenomenon of lock-in (Kogut, 1991; Dosi and Kogut, 1993) in relationships because of entrenchment of routines, has been identified by Bianchi and Guaitieri (1990, p. 101) in the case of the restructuring of the organization of production in the Third Italy. They find that the social rules which have developed in industrial districts inhibit change towards a new (in this case larger scale) organizational model. As in this case hierarchy is absent as well, it provides a nice illustration of some of the observed mechanisms. Imai (1989) points to a similar effect in Japanese networks, where the historical process by which the networks have come about, limit organizational change to slow and gradual adjustments.

**Inertia**

The other pressures for intrafirm inertia defined by Hannan and Freeman are of interest for the present discussion, and may even exert a stronger pressure in interorganizational relations. Hannan and Freeman refer to the transfer of specific resources, constraints on information and internal political constraints. Pertaining to the first, it is difficult to put specific assets to a different use inside one firm, but the transfer of specific assets between firms may be even more complicated, certainly with regard to specialized personnel. These may have relevance only in a specific organizational context, in specific activities. As to the second, constraints on information in a network may be high as well, as a complex web of coalitions requires a considerable ability of individual firms to process information. Finally, political pressures in a set of coalitions may be most important. A shift of activities or a change in the strength of a linkage between firms in such a set, may shift the power balance between firms and thereby incite firms to undertake actions to maintain the status quo. Hence, the pressures for inertia that operate intrafirm, are also of relevance in interfim relationships and form a hindrance to breaking established routine and changing the existing organizational form.

**Discussion**

Some theoretical reasons supporting the view that change in interorganizational relationships is a difficult task, have been discussed (see table 6 for an overview). These are directed to organizational change in general. The question is whether the identified forces also hold in the case of organizational innovation. As organizational innovation is a subset of organizational change, it can be concluded that this is indeed the case.

It may be possible that in organizational innovation the identified problems will be magnified. The reason for this is that the legitimacy (Hannan and Freeman, 1977) of innovations is always questioned. If change from one organizational structure to another known organizational structure is difficult in long term relations, than certainly a change from an existing organizational structure to an organizational innovation is a more complicated matter, for the characteristics of the organizational innovation are not known precisely in advance and therefore there is considerable insecurity with regard to the benefits to be obtained. Moreover, because of the novelty of organizational innovation, a trial-and-error process of searching for solutions to problems connected to the new organizational form, can usually not be avoided. Such an experimental trial-and-error process requires ongoing interaction which is more difficult to realize between than within firms.

Neither is there an example of how the intended organizational form works in practice, which may legitimize the change. Firms will be more inclined to accept a new form of organizing if there are firms which have already proven the effectivity of the new form. As in the case of innovation, no such precursors exist, the effectivity of the new form and the legitimacy of change will be questioned.

Hence, three specific aspects that distinguish organizational innovation from reorganization, strengthen the effect of the barriers to change in interorganizational relationships discussed above. These are insecurity with regard to the benefits, the need for experimentation and the lack of legitimacy.

Next to these inhibiting factors there may also be stimulating factors. For instance, in interorganizational relations ideas can come from two sides, so that organizational problems may be
solved (and perceived) quicker. In literature on organizational innovation this effect has not been discussed, whereas for technological innovation it is wellknown.

The question is how serious this drawback of related and supporting industries is. Aldrich (1979, p. 199) claims that for individual firms in a network the necessity to change may be limited. The reason for this is that other companies in a network can absorb possible shocks. This claim, however, only holds when there are no externalities. When this is not the case, Aldrich's contention does not hold. Moreover, if each firm in a network reasons this way, no change at all will occur.

The short discussion in section 1 of the competitive impact of organizational innovation has shown, that the strategic implications of organizational innovations are important. A limit on the degree of organizational innovativeness can therefore be an important drawback of interorganizational relations. If however an organizational innovation in which more than one organization is involved, comes into being it can bring a sustainable competitive advantage, for it will not be easily imitated.

All this of course does not mean that organizational innovation in long term interfirm relations is impossible. The foregoing merely shows that there are extra complications in interfirm organizational innovations as compared to intra-organizational innovations. The relative strength of the different influencing forces determines the outcome of the innovative process.

4 Summary

A variety of interorganizational relations can be found in clusters. These can be classified as long term, short term and non-cooperative relations. Each of these three forms has clearly separate characteristics and contributes to organizing the cluster. This pluriformity may add to the dynamics of clusters. The three forms also have a different impact on the emergence of new organizational forms in clusters.

The hypothesis seems to be warranted that organizational innovations can be effected negatively by the existence of long term interorganizational relations in clusters. Embeddedness in an elaborate network of such interorganizational relations may hinder the organizational innovativeness of individual firms. Hence, there seems to be a trade-off between the high level of technological innovativeness of interorganizational relations and a lower level of organizational innovativeness. Theory predicts (and some empirical research has found) that organizational innovation as opposed to technological innovation is not enhanced by the presence of elaborate relations between organizations. The presence of long term interorganizational relations slows down the process of organizational innovation both within and between firms.

An implication of this is that policies aimed at strengthening interorganizational relations in order to stimulate technological innovation, can also introduce rigidities in relationships so that change of organizational form can be undermined. In the long run this may mean that the competitiveness of the cluster can be challenged.
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