

Activity coordination from a firm perspective -towards a framework

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Abstract

Firms perform a multitude of activities. How activities are being performed, in isolation and in combination, are determinants of the costs and revenues of a firm (Håkansson and Snehota, 1995). Their combination highlights dependencies present between activities, which in turn are managed by coordination (Malone and Crowston, 1994). The paper takes the individual activity as the starting point, where after expanding into a network of interdependent activities, at the same time as relating to the individual firms performing the activities. The conclusions hold that by analyzing both sequential and parallel activity interdependencies, using two sets of analytical concepts, it is possible to capture activity interdependencies of importance to an individual firm.

Keywords: activities, coordination, networks

Introduction

Firms perform a multitude of activities. Some firms produce and sell products and/or services to other firms, others are specialised at transferring and storing products, which in turn have been produced by someone else. They perform activities related to the internal processes of the firm, but they also perform activities aimed at connecting to the activities of others, for example customers and suppliers. Activities both within and across firm boundaries need to be related to each other, considering for example the different stages of a production process, or the need for planning the manufacturing of products with the subsequent delivery of them. The resulting dependencies between activities need somehow be managed, something, following the definition by Malone and Crowston (1994), identified as coordination. This paper will propose a set of concepts for the exploration of a firm's coordination of its activities, considering activity dependencies present both within and across firm boundaries.

Problem formulation

How activities are being performed, in isolation and in combination, are determinants of the costs and revenues of a firm (Håkansson and Snehota, 1995). Furthermore, there are several developments related to the way firms interact, emphasising the increased importance and complexity related to activity coordination. Firms are to an increasing extent customising their products and services. The ability of adapting to customer needs is emphasised as firms attempt to differentiate their offerings (Natarajan, 2004). Besides differentiation, there are several other reasons for the emerging customisation trend, for example the establishment of BTO and JIT strategies (e.g Holweg and Pil, 2001; Katz, 2007). In addition to such industrial developments, other trends imply the growing importance of coordinating activities across firm boundaries. As firms are increasingly focusing their manufacturing activities (Brush and Karnani 1996), they are also to an increasing extent relying on outsourcing activities previously performed within the boundaries of the firm. Increased outsourcing means that geographical, as well as cultural, distances tend to grow, putting additional strains on the coordination of activities, but also emphasising its increasing importance.

Besides merely concluding the importance related to activity coordination, there are also a number of challenges with it. Among other, there is a potential conflict in developing individual activities versus the structure of which these are part. Exemplifying with a manufacturing firm, its different stages of production naturally need to be aligned. Making capacity increasing investments in only some stages of a production process only result in higher costs unless the capacity of the other stages in the same process are also

increased. Investment decisions therefore need to consider all activities being performed within the boundaries of the firm, identifying bottle-necks and investments increasing total output. In addition, increasing output is quite pointless unless the firm's customers can absorb the increase, highlighting the need of coordinating activities across firm boundaries. As if not enough, an activity is often part of several structures, for example related to several end-products. Coordinating one structure makes it potentially more difficult to coordinate another. For example, if an activity is used in the production process of two different products, these might put somewhat different demands on the features of the activity. It then becomes necessary to prioritize and modify in accordance with both processes, implying that coordinating the activity with regards to only one of them could be potentially detrimental to the other.

Activity coordination has been focused upon by numerous researchers in a variety of research settings. There are for example countless examples of research within organisation theory focusing on intra-organisational coordination, whereas inter-organisational coordination have been treated in research streams such as supply chain management (e.g. de Souza et al., 2000; Natarajan, 2004; Simatupang et al., 2002; Jain et al., 2006), supply networks (e.g. Harland et al., 2001; Danese et al., 2004) and project management (Jha and Iyer, 2006 and 2007), just to mention a few. All of this research emphasises the importance of coordinating activities for pursuing goals related to lowering costs, increasing customer satisfaction, increasing flexibility in operations etc.

This paper will present analytical concepts suitable for identifying activity dependencies and thereby also their subsequent need for coordination. The reasoning held and conclusions made in this paper will differ from previous research by taking the individual activity and the firm as a starting point, where after expanding into a network of interdependent activities. By doing this, it is believed to target the interdependent nature of activities, enabling the pursuance of the aim of this paper.

Methodology

This is primarily a conceptual paper, suggesting a number of analytical concepts for activity analysis. The empirical work explaining the initial interest in activity coordination stems from an ongoing research project within the construction industry. In this, six different firms have so far been interviewed, focusing on inter-organisational exchange related to two specific material deliveries.

Guided by the interest of exploring how a firm coordinates its activities, both within the boundaries of the firm and through developed business relationships, a theory, allowing for capturing the complexities related to a firm's management of a multitude of coordinative needs, will be drawn upon. The Industrial Network Approach (INA) (e.g. Håkansson and Snehota, 1995; Ford et al., 2003) provides a conceptual toolbox suitable for describing how firms interact, form business relationships, and thereby also experience a need for coordinating their respective activities. Therefore, the guiding assumptions related to the nature of industrial exchange, and provided by the INA, will be used, as will specific concepts believed to be of importance for approaching a framework for activity coordination.

Towards an analytical framework

Coordination is by Malone and Crowston (1994) defined as "*the process of managing dependencies among activities*" (p. 87). Starting with the individual activity it is easily recognized that the industrial reality contains a multitude of various activities. When focusing solely on individual activities, these might seem to have a generic value, for example considering a production or exchange activity.



Figure 1. An individual activity, depicted as an arrows.

The activities of a firm

Someone, an actor, naturally needs to perform individual activities, one principal reason for the existence of firms. Furthermore, an activity is dependent upon how it relates to other activities. Placing a product or service in the hands of the final consumer is dependent upon the successful performance of a number of related activities, emphasising the presence of activity interdependencies. Analysing activities in isolation does not capture these interdependencies between individual activities. Therefore, a somewhat different figure needs to be developed. As activities are always performed by actors, the firm (in this paper identified as the principal

actor) is considered a suitable starting point when analysing dependencies among activities. In the figure below, a firm performing four activities is depicted. The firm needs to perform these activities as efficiently as possible, but, in addition, it also needs to consider how to relate them to each other. It might be that the four activities can be performed almost without being related, but, more likely, they will be interdependent and in subsequent need of coordination (following the definition by Malone and Crowston (1994) presented earlier). This notion is highlighted in the figure below, as the four activities have been aligned to each other.

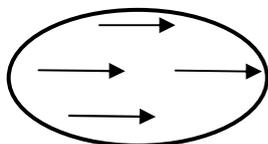


Figure 2. The firm performing four individual activities.

In accordance with the arguments made here, a firm can be seen as a bundle of activities (Gadde and Håkansson, 2001). Conceptually, the bundle of activities can be identified as an activity structure (Håkansson and Snehota, 1995). In the figure above this structure consists of four activities. The firm is occupied with performing and coordinating these four activities in the best possible way. Letting the boundaries of the firm delimit the analysis of activity coordination, the coordinative need focuses solely upon managing these internal activities. For the firm this is suitably done by utilizing its resources in the best possible way, i.e. by capturing economies-of-scale. If not having to take external activity interdependencies into account the only limits for this resource utilization are set by the character and interdependence of the internal activities.

The activity link

Extending the analysis, it immediately becomes evident that the firm has connections to other firms, for example suppliers and customers. When two firms are involved in a business relationship, a firm’s pursuance of economies-of-scale becomes somewhat more problematic than when only considering the individual firm. The need for coordination between two firms is present at the relationship level, channelled through the developed business relationships. Interdependencies on this level are conceptualised as activity links, resources ties and actor bonds (Håkansson and Snehota, 1995). These together create the substance of the relationship, illustrated by the bigger arrow in the figure below. This paper focuses upon the presence of activity links, highlighted as the smaller arrow within the bigger, thus indicating activity links as being one part of the substance of the relationship. The concept of activity links extends beyond the individual activities that connect firms to each other and can therefore be seen as going both ways. In comparison, the actual activities always have a direction, a start and a finish, as indicated by the one-way arrows within the boundaries of the firms.

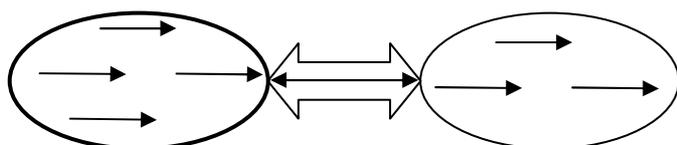


Figure 3. The focal firm involved in a business relationship with another firm to which it delivers some kind of output.

There is a dyadic interdependence between the two firms, whereas the activity interdependencies present can be of many different types. The two firms enter into the relationship with their own sets of internal activities, as elaborated upon above. With these in mind, the firms need to decide upon to what extent they are willing and able to make adjustments to each other. Their exchange can be much standardised, often in connection to the customer buying standardised products, which in turn can be delivered from an inventory of finished products. This means that the focal firm (in this example acting as a supplier) has very little need for adjusting its internal activities to suite the needs of the customer. On the other hand, the exchange can be developed as a result of specific needs of the customer, for example regarding product characteristics and delivery terms. In this case, the focal firm may experience a need for adjusting its internal activities. With regards to the strength of existing activity links, these tend to be stronger as adjustments are made, although also a much standardised business relationship can be identified as having strong activity links in some dimensions (for example considering product or process).

Most firms have a number of suppliers and customers, implying the need to manage activity links to all of these at the same time, exemplified in figure 4 below.

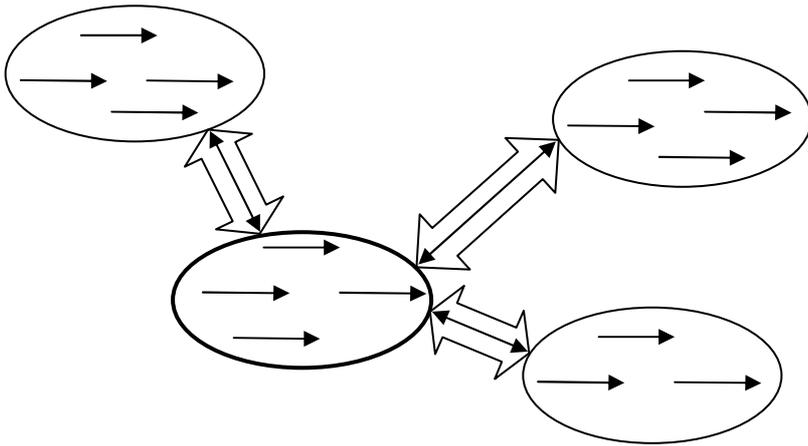


Figure 4. The focal firm involved in several business relationships, including both suppliers and customers.

This sheds new light on the discussion of adjustments above and it also has consequences for the coordination of a firm’s internal activities. If a firm had only one business relationship, as in the example in figure three, deciding upon which adjustments to make would merely be an issue of its consequences in that particular relationship. In addition, after deciding upon this, internal activities could be adjusted accordingly, making it possible to utilize resources in a way pursuing economies-of-scale.

Given that the focal firm has several business relationships, the consequences related to making adjustments in one individual relationship needs to be assessed somewhat differently. Adjustments in some relationships have the possibility of affecting other relationships, for example considering two customers interested in products putting different demands on the firm’s activity coordination. The focal firm then needs to assess each business relationship with regards not only to the potential consequences related to making adjustments in that particular relationship, but also to how the activity coordination in each relationship will affect the other.

The activity chain

The activity links a firm is involved in are in some instances directly related. This is for example the case when considering the production and transference of an end-product, from raw material to finished product in the hands of the final consumer. Extending the analysis in a vertical direction allows for the identification of activity chains, as illustrated below. The concept of an activity chain can be identified in “the backward linking of activities necessary to achieve a certain performance” (Håkansson and Snehota, 1995, p. 56). This means identifying the sequence of activities preceding and making possible a certain activity (ibid).

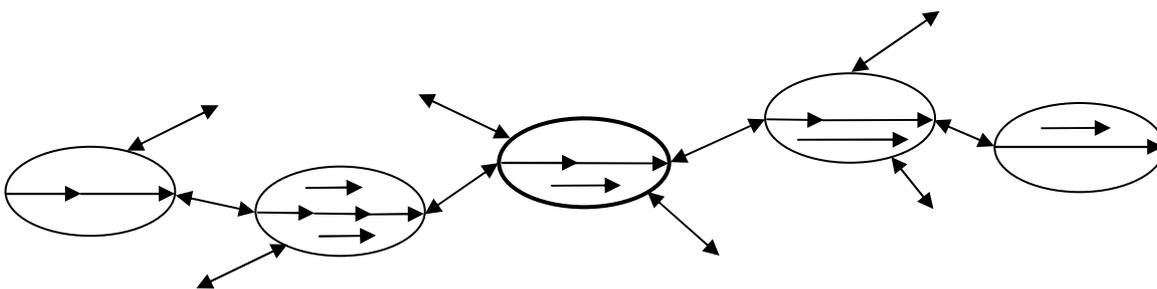


Figure 5. The focal firm highlighted as involved in an activity chain, no longer indicating the entire relationship substance, but instead only focusing on activity links.

From the perspective of the individual activity chain, the focal firm is interested in coordinating its activities in the best way possible for creating integration between the activities of the chain members. Each firm, being member of the chain, performs a number of activities linked in sequence, where the activities of one firm build on those performed by other firms and enter into those of yet others (ibid). Not all internal activities of a firm necessarily relate to a given activity chain, something indicated in the figure above.

As firms usually have more than one customer or supplier, as well as is involved in the refinement of more than one end-product, a single activity chain does not capture a firm’s total need for activity coordination. This very much resembles the discussion above, where a distinction was made depending on how many

individual business relationships are included when analysing a firm’s need for activity coordination. Given this, the figure above can be somewhat extended, now including two activity chains of which the focal firm is part.

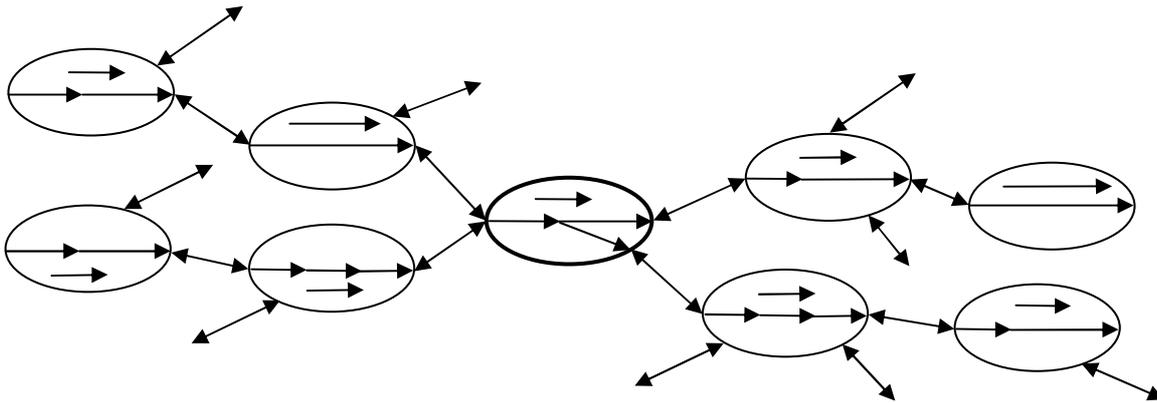


Figure 6. The focal firm involved in two separate activity chains.

Furthermore, since the activity chain is only related to ‘a certain performance’, this performance needs to be put in a context of other performances, for example in relation to an end-product. Given the conceptualisation of activity chains above, revealing activity links external to the specific activity chains, a more network-like structure reveals itself.

The activity pattern

If acknowledging that a focal firm is always part of several activity chains, this is naturally also true also for the other firms, with which it has developed business relationships. This leads to the analysis extending into a network (figure seven). From an activity perspective, this is by Håkansson and Snehota (1995) identified as an activity pattern.

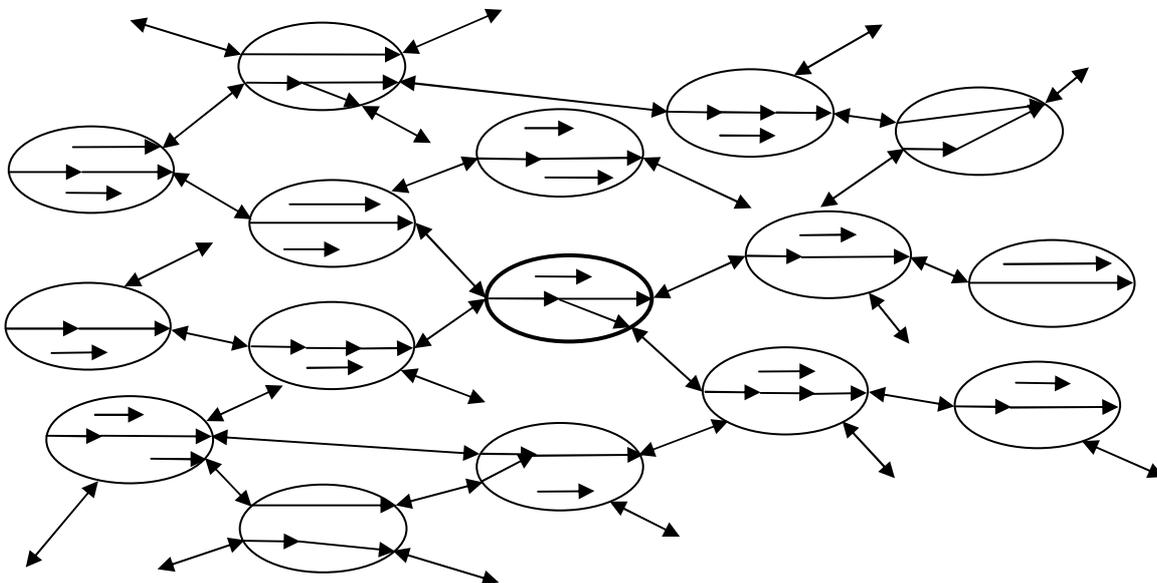


Figure 7. The focal firm in its activity pattern.

The complexities related to an activity pattern are considerable. Not only are there a very high number of activity interdependencies present, they also change, as a consequence of the dynamic nature of networks. Furthermore, each and every firm positions itself differently, compared to its counterparts. One of the reasons for this is that there exists no generic view of the network; instead the observed network lies in the eyes of the beholder. This can be conceptualised through the recognition of so-called ‘network pictures’, symbolising the subjective network view of individual managers (e.g. Ford et al., 2003, Öberg et al., 2007). As activities are coordinated by firms, this means that each firm will coordinate its activities in accordance with its subjective understanding of the activity pattern in question (although in practicality hardly expressed in this way). This is an additional aspect to take into account when enquiring into a firm’s coordination of its activities.

In the successive development of the activity pattern above, a number of difficulties in need of consideration have been indicated. These will, in the upcoming section, be interpreted into concepts for activity analysis.

Concepts for activity analysis

Two distinct sets of concepts will be presented, explained and related to the activity analysis above. These will be argued to together form the foundation for a framework for the exploration of a firm's activity coordination. For analysing activities being interdependent in parallel, the concepts of similarity and variety will be used. For analysing activities being interdependent in sequence, the concepts of complementarity and close complementarity will instead be drawn upon.

As established above, the industrial reality can be conceptualised as a multitude of various activities. Firms performing these activities naturally need to have the appropriate capabilities. Using the concepts introduced by the INA, a capability can be understood as a resource, including both tangible resources, for example machines and facilities, and intangible, for example the knowledge and skills of the personnel. Adopting the definition provided by Richardson (1972), similar activities are activities that require the same capability for their undertaking. This means that the capability, or resource, can be used for undertaking more than one activity (Dubois, 1994). This indicates what is here identified as parallel interdependence between activities. A machine possible to use in several production stages exemplifies such a resource, but it can also be a resource enabling the parallel undertaking of two or more separate activities. The concept chosen to balance this similarity is variety. This is equalled to what Richardson (1972) denotes as dissimilar activities, activities requiring different capabilities for their undertaking.

When considering only activities within the boundaries of a firm, the difficulty is related to maximising both the activities in isolation and their coordination. If the firm is allowed to pursue economies-of-scale in operations, not considering whether someone absorbs the produced outputs or not, this will enable the firm maximum efficiency. Standardising activities and organising resources accordingly will maximize their utilization. Activity standardisation therefore implies utilizing similarities between activities. For this reason, similarity between activities indicates that they are probably most suitably undertaken within the boundaries of a firm (as argued by Dubois (1994) in connection to close complementarity, elaborated upon below). Introducing the notion of a firm having several business relationships, which in turn have different needs, complicates activity coordination. The need for variety is introduced to the firm through different business relationships. These relationships differ with regard to the character of their activity links, in some cases making it necessary for the firm to adjust their activities specifically to an individual relationship. The management of specific requirements in an individual relationship might for example necessitate the customisation of products and individualisation of services. In these cases the advantages related to similarity between activities must be balanced with the need for adjusting activities to individual relationship. From this perspective, the management of individual relationships is costly, for example considering the need for a firm to acquire new resources.

In the identified activity pattern above, there is a general direction of the activities, as industrial exchange is meant to result in an end-product in the hand of the end-user. The direction of the activity pattern highlights the sequential, or serial, interdependencies present between activities. This is especially evident in the identification of activity chains, as each firm, being member of the chain, performs a number of activities necessary to sequentially refine and deliver a certain performance. Activities being sequentially interdependent need to be performed in a certain order, as one activity can only be performed given the successful completion of a previous activity. Two neighbouring concepts that can be used for focusing on these sequential interdependencies between activities are complementarity and close complementarity.

Complementary activities represent different phases of a production process and require coordination (Richardson, 1972). Indicating an even stronger need for activity coordination, close complementarity between activities denotes an activity directed to a certain other activity (Dubois, 1994). This distinction represents the difference between standardised (general) and customised (specific) activities, where the former are performed for various purposes and users, while the latter are part of only one end-product related activity structure. From a sequential perspective, a firm needs to perform both complementary and closely complementary activities, acknowledging the concurrent need for performing activities of more general nature, among other for pursuing economies-of-scale, and more specialised, for adjusting to the different need of individual business relationships.

Conclusions

From an individual firm perspective, there exists an apparent need for the coordination of activities, both within and beyond the firm boundary. The way this coordinative need is best facilitated depends on the characteristics of the interdependencies present in individual business relationships. Taking the activity pattern in figure seven as point of departure, a general direction of the activities present can be distinguished. They are in the figure directed from left to right, considering that activities are performed in order to refine and transfer products and services from point of origin to point of consumption. Considering this, the sequential interdependencies present between activities are obvious, connecting activities vertically along the activity pattern. These can be analysed using the concepts of complementarity and close complementarity.

In addition, activities can also be identified as interdependent in parallel, highlighted using the concepts of similarity and variety, which in turn connect to the utilization of the firm's resources. As opposed to the sequential interdependencies, the parallel interdependencies can be analytically identified as running perpendicular to the direction of the activity pattern. Therefore, the analysis of both sequential and parallel activity interdependencies in the activity pattern will capture existing interdependencies, influencing the individual firm. They therefore also constitute the primary building blocks of an emerging framework for the exploration of a firm's coordination of its activities.

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