Coalition Formation in Networked Innovation: Directions for Future Research

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Abstract

During the last several decades, we see a tendency towards openly distributed knowledge. Whereas we experienced an open source movement in the 80's, we now see that open learning and open innovation have become popular. Akin to open source code encouraging transformational creativity (Boden, 2004), open or networked innovation may lead to more effective organisational learning (Sloep, 2009a). This process of open knowledge exchange involves short time commitments, similar to those in Ad-Hoc Transient Communities (AHTC). We would like to pose a new view on the interpersonal ties in networked innovation, that is, the view of interpersonal ties as coalitions.

Networked innovation occurs on three levels: the micro level, the meso level, and the macro level. Micro level coalitions are formed on the personal level. Meso level coalitions are formed by units of people within organisations. Organisations form coalitions or alliances with other parties on the macro level of networked innovation. Each of these levels has their own problems that hinder the process of networked innovation. Examples are self-interest (micro), negative ties between units (meso) and so-called *logrolling*. People need to be informed of the value of their candidate coalitions so as to develop intrinsic motivation for co-operation.

We propose the view of interpersonal ties within networked innovation as coalitions. We compare characteristics of Granovetter's characteristics of interpersonal ties (Granovetter, 1973) with the characteristics that were identified by Begley et al. (2008) to underscore this view. Afterwards, we propose an initial model of the antecedents of coalitions. These antecedents were described earlier by Brass et al. (2004) and we suggest an extension of this list of antecedents. Besides, we provide an initial model that visualises the relations between the antecedents and coalitions. As this is part of ongoing research, we provide a methodology for further investigation of the process of coalition formation within networked innovation. This includes an extensive literature review, model development, simulation and verification through an online experiment. This will hopefully answer our questions on how coalitions are formed within networked innovation, what the structure of these coalitions is, how they are sustained and how the payoff is divided.

Keywords

Coalitions, networked innovation, interpersonal ties, learning networks.

Introduction

Obviously, the 1973 paper by Mark Granovetter (1973) has been acting a goad to research on communities, structural holes and intellectual capital. Granovetter argued that focusing on weak ties rather than strong ties could open up discussion on the relations between groups. He concludes that coalition structure could be one of special variables that are of importance in linking the micro (relations within groups) to the macro level (relations between groups) perspective of networks. Jones, Ferreday and Hodgson (2008) build on Granovetter's work by applying the notion of weak ties to networked learning. They report on a case study of principals in a knowledge-sharing network. This learning network did not consist of large time commitments or any high degree of intimacy, and may therefore be regarded as a network consisting of weak ties. Short time commitments, also referred to as temporary or transient connections, are also experienced within *ad hoc transient communities* (AHTCs) (Sloep, 2009a), which are communities that are formed for a particular purpose and exist for a limited period of time (Berlanga et al., 2008). Such AHTCs involve people that connect to one another. Making peer learners aware of candidate peer connections within AHTCs may positively influence

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their commitment and relieves the tutor from work overload. Next, computationally informing them on the value of their connections, or candidate coalitions, as we would like to call these, may help them in developing and sharing knowledge collaboratively effectively. If we transfer this to an organisational context, which has been suggested by Begley et al. (2008), we see that firms rely on reciprocity when exchanging and developing knowledge. This process of knowledge exchange and joint knowledge development, which we will elaborate on later, may take place on three organisational levels:

1 beyond the borders of the firm, the macro level;
2 within the borders of the firm on the inter unit level, that is to say, the meso level;
3 between people within an organisation, the micro level.

The aforementioned research on networked learning, innovation and coalitions have lead to a proper theoretical foundation. When viewed from a practical perspective, they, however, lack in their approach. We suggest that the coalitions that are formed on the macro, meso and micro level of networked innovation are not always optimal. This thought is founded on the numerous research attempts to capture the way people effectively co-operate in teams and the common flaws during their collaboration, such as social loafing (Chidambaram & Tung, 2005; Karau & Williams, 1993; Kerr & Bruun, 1983; Latane, Williams, & Harkins, 1979; Liden, Wayne, Jaworski, & Bennett, 2004) and the lack of accountability (Janis, 1982; Paulus & Brown, 2007). In principle, people are self-interested and they therefore need an incentive for effective collaboration. Hence, there is a need for proper metrics, which can give insight in the value of candidate coalitions in networked innovation and networked learning.

This will shed new light on both networked learning and networked innovation in the sense that we propose to use coalition theory to give stakeholders insight in the value of candidate alliances. In this way, firms may become more informed on the value of their candidate coalitions when searching for inter-firm alliances, leading to three, but not limited to, outcomes identified by Sie et al. (2009): (1) the optimisation of coalitions, (2) neutralisation of negative factors that lead to non-optimal coalitions and (3) the formation of groups in advance of the innovative process to foster effective team work.

This paper will provide a theoretical basis for research on coalitions in networked innovation and proposes a methodology for developing such a metric. The paper is structured as follows. We will start off with an elaboration on networked innovation. We will regard this in a broader perspective, that is, we will present three levels of networked innovation, the micro, meso and macro level. Afterwards, we will dig into the characteristics of networked innovation and Granovetter's characteristics of interpersonal ties. We will compare these with the characteristics of coalitions. This comparison underscores the view of interpersonal ties as coalitions. Next, we will provide an initial model of the antecedents of coalitions. Lastly, we will provide a methodology for research on coalitions in networked innovation.

Networked innovation in a broad perspective

To keep up with today's dynamically changing economy, firms need to be innovative. They seek to develop new products and novel solutions to sustain their market share. While historically we see that this innovative process took place mainly within the firm, we now see a tendency towards open development of knowledge. For a number of reasons, organisations have adopted a new type of business model, that is to say, open innovation. Open innovation is organisational learning through purposeful sharing of knowledge and assets. It involves a network of organisations or individuals within organisations that would like to profit from each other's complementary knowledge by co-operatively sharing their knowledge. We would therefore like to use networked innovation to denote this phenomenon. In co-operatively sharing knowledge, organisations and people form connections, which we would like to refer to as *coalitions*. A coalition is a temporary alliance of distinct parties that share a common intention, based on their individual goals. The use of complementary knowledge may be an incentive for organisations to co-operate and form coalitions. This often involves a reciprocal action, which is the revealing of an organisation's own knowledge. Besides, an organisation may choose to purposely reveal knowledge to invite others to build on this knowledge. This is, for example, often used in software development (open source). The open source movement, which started in the 90's of the previous century, was one of the first steps towards the open sharing and development of knowledge. When releasing software as open source, a firm's knowledge development acts as a *quid pro quo* for its knowledge spillover, which is adopted by a community of programmers. In doing so, the firm forms short time

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commitments with programmers that may be identified as temporary coalitions on the macro level. A problem arises here though, which is the short time span aspect of the coalition. People are in principle self-interested, which shows in the well-known prisoner's dilemma. In the prisoner's dilemma, suspects A and B have been arrested. They both have the option to cooperate or defect. If both stay silent (cooperate) they will receive a low sentence. If they both betray each other, they will receive a moderate sentence. If A betrays B and B stays silent, A will receive no sentence and B receives a high sentence (and the other way around). People are likely to defect if they know they are only to meet once. An obvious solution is to let them knowingly interact multiple times. The parties involved, though, are not always aware of this.

Units within firms have to collaborate more and (more) often in their development of new products and services, thereby forming coalitions on the inter-unit level, or meso level. These inter-unit ties occur in both a formal (e.g. knowledge exchange) and an informal setting (e.g. making friends at the coffee machine). This is level is influenced by both characteristics of the individual (micro) level and the inter-unit level, what makes it interesting to research. Therefore, studying the micro and meso level of inter-organisational ties simultaneously may contribute to a better understanding of both (Brass et al., 2004). Tsai and Ghoshal (1998) found that social interaction significantly relates to the extent of inter-unit resource exchange, which in turn had a significant effect on product innovation. Social interaction involves people, and these people are often self-interested as we mentioned earlier. The bad relations between people (whether or not in different units), which are regarded as negative ties, may also influence inter-unit performance badly. Hence, it may pay off to focus on the social interactions, or in our wordings, the formation of coalitions, and their antecedents in an organisational context. We suggest that identifying these antecedents may be of benefit to fostering more positive ties within networked innovation.

On the micro level, people may form temporary coalitions within the firm, so-called interpersonal coalitions. This view has already been suggested by Begley et al. (2008), who argue that people within organisations deploy knowledge assets collectively, thereby forming temporary coalitions to foster growth. Based on an extensive literature study, they distinguish a number of characteristics and dimensions of coalitions that, among other characteristics, include knowledge on its structure, members, dependencies and power. The problems that arise in interpersonal ties include, but are not limited to, hierarchy, social loafing, self-interest and reputation. Analysis of the influence of such problems may help us in finding a proper way to deal with these problems.

Thus far, we have identified three organisational levels at which coalitions emerge. To depict this, we refer to figure 1 below.

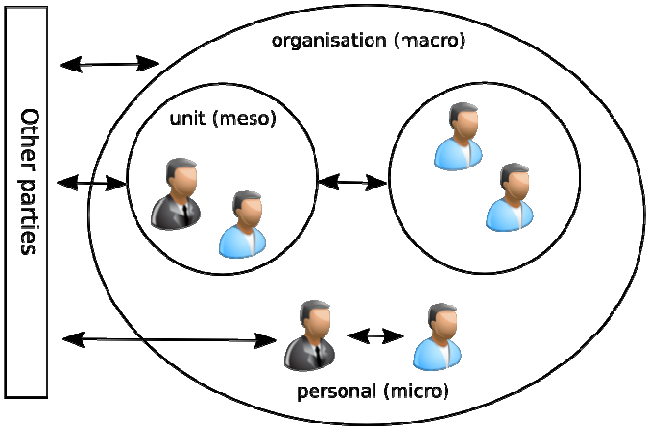

Figure 1: Overview of coalition types in an organisational context. The arrows denote candidate coalitions.

By exchanging knowledge, organisations try to form coalitions, but here a problem arises, explained hereafter. In principle, organisation A is unaware of the complementary knowledge and assets that exist in organisation B.

They thus need to be informed on the complementary knowledge. But still, organisation B needs to have an incentive for sharing that information with organisation A. In other words, organisation B needs something back in favour for sharing its knowledge. This is denoted by the term *logrolling*, as seen in congressional voting (Kau & Rubin, 1979). Politicians often reciprocally vote for each other and thus exchange favours. To do so, they both need to be aware of the value of exchanging favours. In other words, they need to be mutually interested in each other's power and status. Hence, if we translate this to networked innovation, organisations need to be informed what the added value of a knowledge sharing coalition is. This involves studying factors that influence the strength of candidate connections, or ties, in (learning) networks of people.

A comparison of interpersonal ties and coalitions

Viewed from the perspective of learning, we see that innovation and creativity are ways for people to learn from each other (thereby forming temporary coalitions), or to create new things with the knowledge they have. When we create new things or concepts with the knowledge we have, we experience creativity. In a corporate environment, creativity and innovation are often to be found at research and development departments. Teams within these departments thrive on creativity and innovation, thereby developing new concepts and products that should raise or sustain a firm's market share. Akin to open source code encouraging transformational creativity (Boden, 2004), open or networked innovation may lead to more effective organisational learning (Sloep, 2009b). The term open innovation was coined by Henry Chesbrough (2003) who underscored that in today's economy, firms cannot rely on their own R&D departments performing basic research anymore. Firms rather build on research performed by other research departments. There are a number of incentives for networked innovation (Chesbrough, 2003) that include: (1) Not all experts work at one organisation or location, (2) we do not need to originate research in order to profit from it and (3) external R&D can create significant value, and internal R&D should claim a portion of that value. These incentives are underscored by the European Commission deciding upon the year 2009 to be the year of Creativity and Innovation. They claim that learning takes place in the presence of others, thereby changing interaction patterns within social and corporate environments (European Commission's Web page, 2009).

Now that we have illustrated the importance of (research on) networked innovation, we would like to draw attention to the analogy between networked innovation and coalitions. Granovetter defines the strength of interpersonal ties by the following characteristics:

Amount of time
Emotional intensity
Intimacy
Reciprocal services

Coalition theory, which emerged from a variety of domains, such as sociology, management studies, political studies and behavioural studies, provides a variety of perspectives on interpersonal ties. From literature, Begley et al. (2008) extracted the following characteristics of coalitions:

Structure
Members
Dependence between members
Time
Power
Orientation
Capabilities

The influence and occurrence of these characteristics in coalitions varies as the structure of the coalitions changes. For instance, dependence between members may change as the structure of a coalition changes. It gradually changes from (1) flexibility of contract when the coalition's structure is self-organising and shifting, to (2) formalisation of contracts when the coalition is a collective that lacks norms, and (3) formal contracts when the coalition structure is engineered. Compared to Granovetter's characteristics of interpersonal ties, we see that they are somewhat similar, but expressed differently. The amount of time obviously relates to the time aspect of coalitions. The emotional intensity and intimacy relate to the characteristics 'members' and

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'dependence' identified by Begley et al., while reciprocal services are covered by dependence, power orientation and capabilities. We propose the following mapping of these characteristics:

Table 1: A mapping of Granovetter's interpersonal ties characteristics and Begley et al.'s characteristics of coalitions

Granovetter / Begley et al.	Structure	Members	Dependence	Time	Power	Orientation	Capabilities
Amount of time				X			
Emotional intensity		X	X				
Intimacy		X	X				
Reciprocal services					X	X	X

The reason for mapping the above is to show that, although they may be subsumed, the characteristics of interpersonal ties are not limited to Granovetter's characteristics of interpersonal ties. In an organisational context, for instance, we are faced with competing incentives. In both an intra-organisational context and inter-organisational context, people compete against each other, regardless whether they are presupposed to co-operate or not. This may severely hinder the group's dynamics. This is underscored by the notions of *homo economicus* by John Stuart Mill ("John Stuart Mill - Wikipedia, the free encyclopedia," n.d.) and *satisficing* by Herbert Simon (Simon, 1982). The term homo economicus defines man as a being who strives to receive as much payoff as possible with a minimum amount of labor. Social loafing is a phenomenon that best illustrates this notion. *Satisficing* was introduced by Herbert Simon, contaminating the words *satisfy* and *suffice*, to illustrate that group work often results in sub-optimal solutions. This is due to the fact that people in teams often come up with a solution that satisfies every participant and suffices in its problem solving capability.

An initial model for antecedents of interpersonal coalitions

To this point, we have identified the importance of regarding networked innovation as coalitions. We have analysed the similarities between both, and to give people insight in the value of interpersonal coalitions, we need to first identify the antecedents of coalitions, after which we analyse their influence on the formation of coalitions. We have come up with an initial (and incomplete) model of antecedents of coalitions on the organisation's micro level, that is, the personal level. An earlier attempt by Brass et al. (2004) resulted in a number of antecedents of interpersonal networks in an organisational context:

- Actor similarity
- Personality
- Proximity and organisation structure
- Environmental factors

We would like to extend these with the notion of reputation. Reputation is an important factor when it comes to forming coalitions. As we mentioned before, it is not always profitable to do basic research yourself, and you may be interested in what other parties have to offer with respect to complementary knowledge and assets (Boschma, Eriksson, & Lindgren, 2009), which contribute to the reputation of another party. The importance of reputation in choosing partners is underscored by Jensen and Roy (2008), who showed that reputation is one of the factors that influence the choice for a particular auditor. Besides, concepts such as trustworthiness and centrality within the network may contribute to the reputation of a person. Centrality, for instance, may mean that a person is more informed than others, leading to more innovative power, thus increasing the person's reputation. This is underscored by research on lead users and creativity (Kratzer & Lettl, 2008). We visualise the antecedents of coalitions on a personal level as follows:

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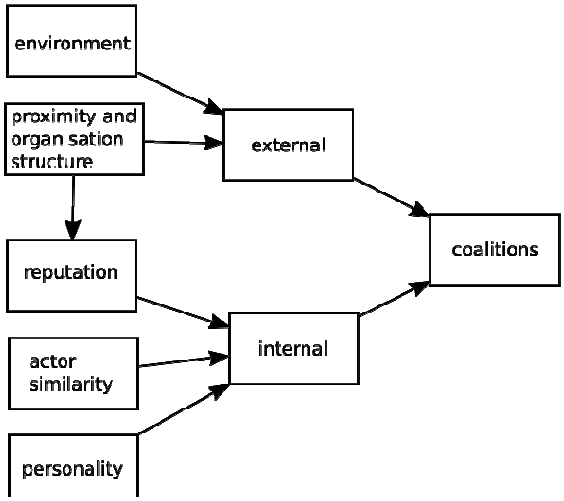

Figure 2: Antecedents of coalitions on the personal level.

Coherent with our argument that centrality influences one's reputation, we drew an arrow from 'proximity and organisation structure' to 'reputation' in the figure above. Besides, we distinguished two types of antecedents: external and internal antecedents of coalitions. This figure is a first aim at modelling the factors that influence formation and emergence of coalitions. We will continue developing this model and develop models for the meso and macro level of networked innovation in the future, eventually leading to a model that is suitable for simulation.

Conclusions and Future Directions

Throughout this paper, we have provided a number of arguments for the view of networks innovation as coalitions. We described the importance of networked innovation, and provided the characteristics of networked innovation. We made an analogy by comparing these characteristics to the characteristics of coalitions. We tried to capture the antecedents of coalitions in an initial model, which is still under development. The link between coalitions and networked innovation seems natural and obvious, but current approaches lack in the provision of an incentive for the effective collaboration between distinct parties. To show the value of coalitions in an organisational context, thereby fostering organisational learning, it is necessary to study the following:

1 What triggers the formation of coalitions?
2 What is the structure of coalitions?
3 How are coalitions sustained?
4 How are the revenues within coalitions (payoff) is divided?

We envisage a number of steps to answer to questions above. We need to (1) analyse which factors influence coalition formation. This achieved by an extensive literature review, which is a continuous activity. We will (2) formalise these factors in a causal model, of which we have given you a preview in this paper. This model will be run as (3) simulations so as to analyse the dynamics of coalitions in networked innovation. The model and simulations will assist in the (4) development of a metric for coalition formation in networked innovation. We will utilise this metric as (4) an intervention in an online experiment.

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