

Sources and Management of Tension in Collaborative Innovation Networks

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Summary:

In dynamic and knowledge-intensive industries, the pursuit of technological innovations has increasingly become the activity of networks of collaborating organizations. Such networks are complex arrangements characterized by a high degree of self-organizing, shared decision making and relational mechanisms of governance. However, the potentially paradoxical nature of collaborative innovation in interorganizational networks generates tensions that challenge their management and stability. This research uses an exploratory case study of collaborative innovation in health information technology to investigate the tensions that emerged in the collaboration trajectory and how the members of the network attempted to address these. The failure of the organizations to sustain their collaborative efforts beyond an initial development phase provides an interesting opportunity to examine the processes of interorganizational network governance and relationship management in the context of collaborative innovation.

Word count (excluding table and references): 1996

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Introduction

Interorganizational collaboration, including between potential competitors, has become a common approach for pursuing innovation, developing new technologies and products, and bringing them to market. This is particularly so in dynamic, complex and knowledge-intensive industries characterized by the convergence of multiple technologies, shorter product life cycles, and increasing research and development costs. In collaborative innovation, organizations work together to co-create value by developing new products while also seeking to eventually individually appropriate a portion of that value. By working collaboratively, they benefit from resource complementarity, risk sharing and greater market power. However, such collaborative relationships are challenging to manage given the high degree of interdependence involved, high levels of uncertainty, and the potential for tension, conflict and instability (Bouncken et al., 2018; Gnyawali & Park, 2009, 2011; Ritala & Sainio, 2014).

Increasingly, the creation and commercialization of technological innovations has become the activity of multiple networked organizations (Batt & Purchase, 2004; Ferraro & Iovanella, 2015; Möller & Svahn, 2009; Rampersad et al., 2010). Collaborative interorganizational networks can be viewed as a response to the level of technological complexity and the diversity of resources and capabilities required to develop new technologies, together with ambiguous and shifting markets and uncertain or non-evident business models for their exploitation (Möller & Svahn, 2009). As a distinct form of interorganizational collaboration, networks are complex arrangements characterized by a high degree of self-organizing and shared decision making. Ferraro and Iovanella (2015) use the metaphor of ‘choreography’ to describe how the coordination of joint activities and ongoing network management are distributed across all members of the network.

This perspective on collaborative interorganizational networks has three main implications the research discussed in this paper. First, the emphasis is on the ‘whole network’ (Provan et al., 2007) – the defined set of collaborating organizations and the multilateral relations needed for them to achieve a collective outcome (Provan & Lemaire, 2012). Second, governance in collaborative networks is centred on interorganizational relationships and the interactional processes that constitute them. Less reliance is placed on formal authority structures or self-interest contracts; instead, emphasis is placed on relational concepts such as trust, reciprocity, meaningful communication, shared expectations and mutual benefit (Batt & Purchase, 2004; Faems et al., 2008; Hardy et al., 2003; Imperial, 2005; Keast & Hampson, 2007). Third, attention moves beyond ex ante factors and initial formation conditions to consider the dynamics of the post-formation processes that are central to managing interorganizational networks and that shape collaboration trajectories (Majchrzak et al., 2015). Such an approach seeks to explain how particular collaborative outcomes arise from imperfectly predictable changes and unintended consequences of human behaviour (de Rond & Bouchikhi, 2004; Madhok et al., 2015).

Collaborative interorganizational relationships are inherently unstable (Das & Teng, 2000a; de Rond & Bouchikhi, 2004; Majchrzak et al., 2015). The complex and ambiguous, even paradoxical, nature of collaborative innovation in interorganizational networks generates tensions and challenges for their management and sustainability (Bouncken et al., 2018; Gnyawali et al., 2016; Jarvenpaa & Wernick, 2011; Ospina & Saz-Carranza 2010). Gnyawali et al. (2016) suggest that these tensions can be the result of dualities inherent in the nature of interorganizational relationships. For example, a tension between mutual investment in joint

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value creation and the desire for individual returns from value appropriation can produce a dilemma for participating organizations, and the need for effective governance and management at the whole-network level. Uncertainty is particularly high where eventual value appropriation is not clear or agreed (Bouncken et al., 2018; Fernandez et al., 2014). Tensions can also arise from contradictions that reflect differences or divergence between collaborating organizations (Gnyawali et al., 2016). For example, the diversity associated with multiple autonomous organizations attempting to work together, each with distinct expectations, strategic priorities, organizational cultures and degrees of influence, requires collective decision-making and joint action by the collaborating organizations and their representatives (O’Leary & Bingham, 2007; Saz-Carranza & Ospina, 2011).

While there is agreement in the literature that facilitating collaboration in interorganizational networks involves complexity, ambiguity and tension, less attention has been given to how these challenges are managed after formation of the network (Ospina & Saz-Carranza 2010). This research addresses this deficiency by asking the following questions:

1. What tensions challenge the sustainability of collaborative relationships in interorganizational innovation networks?
2. How can these tensions be managed?

Research Approach

These questions are investigated empirically through a single significant or ‘critical’ case study (Flyvbjerg, 2006; Meyer & Mayrhofer, 2022) of collaborative innovation in health information technology. In this particular case, the failure of the collaborating organizations to sustain their collaborative efforts beyond an initial development phase provides an information-rich study of the processes of interorganizational network governance and relationship management in collaborative innovation. To construct the case study, we conducted eight semi-structured interviews with senior managers from six of the organizations forming the collaborative initiative (one organization declined to participate in the study and one was unavailable to be interviewed). This was a purposive sample (Schreier, 2018) of key informants selected for their involvement in the formation, operation and management of the project. Each interviewee occupied a senior position within their organization and represented their organization in the project deliberations and steering group. Thus, they were uniquely positioned to provide an informed perspective on the objectives and expectations of the project, the relationships between organizations, and the processes used to work collaboratively, based on their own experience of participating in it (Keast & Hampson, 2007).

Interviews had an average duration of around one hour and were audio-taped (with the interviewee’s permission) so that a transcript could be prepared. Detailed notes were also taken during each interview. An interview guide was used to ensure that all areas of interest were covered. Questions focused on each organization’s motivation for participating in the project, the process used to establish and structure the collaboration, the expected benefits, the processes used to coordinate joint activities and manage the collaborative relationships, issues influencing the nature of the collaboration, and the outcome of the project. The conversations were open ended so that interviewees were not constrained in their answers and specific aspects emerging during the interview could be explored. Available documentation, including the project scope, business and functional requirements, promotional case studies,

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and background information on each organization, was reviewed by the researchers as an additional source of data and to corroborate the data gathered from interviews (Yin, 2003).

A thematic coding process based on open coding (Strauss and Corbin, 1998) was used to analyse the qualitative data collected. Interview transcripts were read and re-read to identify statements that reflected how the process of collaborative innovation and its associated inter-organizational relationships were managed. Each statement was systematically coded to an appropriate category or theme, either derived from prior research or emerging inductively from the data analysis process. Constant comparison of similarly coded data segments enabled the researchers to outline the characteristics of each category or theme in more detail.

Case Study Synopsis

Network-based collaboration can play an important role in facilitating successful healthcare product innovations, including the information systems and technologies that underpin a patient-centred healthcare system (Mouttham et al., 2012). The case study analysed in this paper examines the operation and management of a consortium of eight organizations that sought to develop a web-based Health Information Portal (HIP) to support healthcare consumers in taking a more active role in managing their own health conditions. The HIP was intended to be a low-cost means for individuals to co-ordinate and choose healthcare services targeted to their health status and needs. A web browser interface would allow users to securely interact with a range of content and applications provided by various healthcare service providers, who would connect to the portal via a proprietary integration engine. This entailed each provider developing a specialized adaptor that allowed their application to communicate with the integration engine through standard message schemas.

The consortium was established by HealthTech, a national grouping of companies and organizations interested in developing innovative health information technology solutions. HealthTech was responsible for recruiting and assembling the participating organizations, negotiating and managing a contractual framework, and securing funding from a mix of private and public sector sponsors. One of the project sponsors was SoftCom, an international information technology and software solution provider. Besides contributing some funding, SoftCom provided basic infrastructure such as a server environment and an online collaborative tool. Project management and technical support for the overall integration design and implementation of adaptors was provided by ITConsult, a large information technology services and consulting company with a strong focus in the health sector. ITConsult had been involved with the development of the integration engine to be used in the HIP and were keen to signal their commitment to collaborative innovation in health information technology.

The basic portal technology for the HIP was supplied by Alpha, an established healthcare software solutions provider with a major share of the national primary healthcare practitioner market. The company would also develop the portal's web-based user interface. Initial content and applications would be supplied by three service providers: Beta, the vendor of an online tool for general practitioners, patients and caregivers to access local information related to referrals to secondary and tertiary healthcare services; Gamma, an established provider of healthcare decision support systems to target, screen and manage a range of chronic health conditions; and Delta, a developer of voice and video based applications in a range of industries, including health. Finally, PHO, a large primary health organisation,

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would provide a patient centric and primary care focus in the design of the HIP and user testing.

The first four months of the HIP project involved in contract and funding negotiation and scoping the first phase, the proof of concept, which involved the development, consolidation and testing of a prototype HIP. By the end of six months, the functional requirements and use cases for the proof of concept had been finalized. Confronted with a very aggressive timeline to complete the proof of concept in time for its presentation at an international conference run by SoftCom, much of the technical design proceeded concurrently with this process, rather than consecutively. Despite the tight timeframe, various build and project milestones were missed, delaying the integration and testing of the various components. The final version of the proof of concept was not completed until just before it went to SoftCom for showcasing. Nevertheless, the HIP proof of concept was considered a successful technical demonstration by the various stakeholders. The participants then embarked on a series of workshops to review the first phase and identify an appropriate business model to support the eventual commercialization of the HIP, as a prelude to scoping the second phase of the project, which would involve extending the portal's content and applications and deploying it into a primary healthcare setting. However, these discussions were largely inconclusive, and progress was slow. Then, just over a year from the project's commencement, Alpha abruptly announced the launch of their own proprietary healthcare portal product, effectively ending any further forward collaboration, and the consortium subsequently disbanded.

Preliminary Analysis and Paper Development

Initial analysis of the case study data identified a wide range of issues and sources of tension that challenged the collaborative relationships in the interorganizational network assembled to develop the HIP and ultimately threatened its sustainability (Table 1). Consistent with Gnyawali et al. (2016), these tensions could be considered as arising from either (a) dualities and paradoxes inherent in the nature of interorganizational collaboration or (b) differences and divergence emerging between the collaborating organizations. We focused on how various tensions were manifested in practice, and the actions taken by the participating organizations in response to those tensions.

Table 1: Emergent tensions in the HIP project

Tensions	Tentative theme
Uneven, poorly managed, closed communication	Coordination
Lack of transparency	
Sharing vs protecting information	
Efficiency vs inclusiveness in relation to task allocation and coordination	
Authoritative vs participative approach to project management	
Incompletely distributed trust and relationship strength	Relations
Individualistic vs collectivistic behaviour	
Autonomy vs mutuality/interdependence	
Inter-partner diversity	
Asymmetry in power and dependence	

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Network vs organizational goals	Coherence
Value creation vs value appropriation	
Differing strategic priorities	
Mismatched/incongruent interpretations and expectations	
Different time orientations – short term vs long term	
Lack of a shared governance structure	Governance
Lack of effective formalized agreements	
Underlying business model never formalized	
Incentive structures not aligned to value landscape	
Perceived inequities	

We will develop the paper by categorizing these tensions into a smaller number of overarching themes that represent an analytical trade-off between richness of detail and excessive complexity (Jarvenpaa & Wernick, 2011). Drawing on the literature on interorganizational collaboration, we will discuss the underlying causes of each group of tensions and propose a set of mechanisms or processes for managing them across the interorganizational network.

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