MENTAL MODELS AND AFFECTIVE INFLUENCE IN INTER-ORGANIZATIONAL COLLABORATION FOR NEW TECHNOLOGY

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ABSTRACT

We studied the dynamics of inter-organizational collaboration around the development of an emerging technology in the Finnish electric car ecosystem from 2011 to 2015. We contribute to strategy process research by identifying the distinction between mental models of industry future versus mental models of implementation and to the literature on inter-organizational collaboration by describing how affective influence elicits potential partners' perceptions of the benefits of collaboration.

INTRODUCTION

Inter-organizational collaboration is purported to benefit innovation development and implementation. Companies generate novel insights by combining previously disconnected knowledge and resources from diverse partners (Ahuja, 2000). Collaboration facilitates innovation implementation by increasing coordination between partners and the development of complementary products and services (Adner & Kapoor, 2010). As digitalization reduces the communication and transactions costs between companies, the importance of inter-organizational collaboration for innovation is likely to increase (Benner & Tushman, 2015). Motivating the right partners to collaborate is therefore crucial.

The early stages of inter-organizational collaboration for innovation in emerging technological areas are filled with uncertainty. Many uncertainties relate to technology, as it is not known which ones will eventually be functional and accepted by the markets (Anderson & Tushman, 1990; Greve & Seidel, 2015). There is also behavioral uncertainty since companies cannot know how their partners will behave in the future (Williamson, 1979). A powerful firm "can 'make or break' the future of many of the smaller firms [through various kinds of decisions that are difficult to anticipate]" (Nambisan & Baron, 2013: 1074). Potential partners therefore cannot know with certainty with which companies they are most likely to succeed. The uncertainty can be paralyzing as managers may be reluctant to act when success seems to require too big of a leap of faith.

When people act under uncertainty, they often rely on local and concrete cues to make sense of what will happen and affective reactions influence their choices and behaviors (Damasio, 1994; Huang & Pearce, 2015; Kahneman, 2011). Even though companies employ various means to reduce the impact of local idiosyncrasies and affective reactions, the very early stages of partnership development often rely on unstructured processes and a small number of people (Hallen & Eisenhardt, 2012; Kono, Palmer, Friedland, & Zafonte, 1998; Marquis, 2003). Managers, for instance, may read news articles about some firms' actions but not others; invite managers from a subset of companies for meetings; and get sufficiently excited during a first meeting to organize a second one. These incremental actions may

accumulate into patterns and ultimately shape their partnerships (Plowman et al., 2007). As affective reactions likely influence such unstructured behaviors, affect might influence partnership formation and network building more than prior research has shown

Moreover, prior research has not sufficiently investigated how managers rely on affective factors when implementing their strategies for inter-organizational collaboration. When uncertainty is high, managers' mental representations of the substance of the strategy can vary significantly and influence their choices (Gavetti, 2012; Walsh, 1995). But it is also possible that managers hold different views on how the implementation of the strategic intent should be done. That is, previous research has tended to emphasize managers' mental models of the content of strategy (or strategic intent). But managers might also differ in their mental models related to how to implement their strategic intent, when such implementation likely includes forming inter-organizational collaborations, and how affective factors might contribute to the quality of these collaborations.

METHOD

We studied the emerging electric car (e-car) industry in Finland because this setting provided an ideal theoretical sample for studying the implementation approaches and affective dynamics related to inter-organizational collaboration in emerging technologies. The e-car industry has been under high uncertainty because of several political and technological reasons; the success of e-cars depends on various complementary actors; and there was high local uncertainty. In 2010, there were no e-cars in use in Finland. Two leading companies were competing to collect collaboration partners to dominate the industry. These two companies seemed to have similar potential in terms of the traditional predictors of success. However, over time, one of them became successful and other one failed. Our analyses show how differences in their mental models of implementation and affective influence practices influenced this outcome. We labelled these companies EMO (emotional) and A-NE (affect-neutral).

We followed, in real time, EMO's and A-NE's attempts to develop collaboration with other companies from 2011 to 2015. We collected data through observation (about 300 hours), private interviews (152 interviews with 60 people), and documents (about 4,000 pages).

The data analysis proceeded in parallel with data collection. While the process was highly iterative, it is possible to recognize some key practices that we applied. First, we conducted open coding. Second, we wrote memos and drew diagrams to identify patterns in our data. We also compared our first-order codes in the data. We used the resulting insights in subsequent, selective coding to refine the emerging categories (Strauss & Corbin, 1998). We also used tools such as qualitative variance tables and axial coding to identify patterns between the different concepts, when treated as antecedents and consequences. In parallel with comparing the data segments, we also sought to abstract the data by aggregating similar codes and data segments under more abstract categories (Gioia, Corley, & Hamilton, 2013). We also engaged the research subjects to both elaborate and validate our ideas (Shah & Corley, 2006).

FINDINGS

Similarities in Initial Conditions

Both A-NE and EMO faced a similarly uncertain context for attracting collaboration partners around e-cars in Finland in 2010. In terms of intellectual capital and resources, both A-NE and EMO faired high. A-NE and EMO were also similar in terms of the partners they had at the starting point.

Mental Models of Industry versus Implementation

A-NE and EMO had similar mental models of the industry future and a similar vision for building an international business in that future (they both had developed this vision through rigorous data collection and analyses). However, they differed radically in terms of what we call mental models of implementation—a set of beliefs concerning actions to enact a vision. A-NE's leaders believed that organizations make decisions based on the best available evidence and logical argumentation, and that facts (rather than affective reactions) consequently drive its potential partners' behaviors: "We should be more scientific. What are the trends that are driving this? We should not focus on people's minds but look more factually what is driving this. […] There can be emotional interpretations [by potential partners], but these are still influenced heavily by underlying facts. […] [We need] more desk-research on the facts of policy, financing, statements of OEMs, and so on. We need industrial knowledge for our team to envision a better approach." [A-NE's leader, 4/2012, internal meeting]

In contrast, EMO's leaders believed that affective reactions are not mere side-effects of facts, but can substantially drive decisions. EMO's mental model of implementation was thus clearly separated from its vision of the industry. The implementation approach took affective influences as boundary conditions for what was considered feasible and sought to leverage them in actions that benefitted the development indirectly. As EMO's leader explained: "[Our global vision and our approach to implementation] are different in the sense that, the excitement [we create locally] is a tool and a description of our emotional state. The vision and strategy is a core fundament on which the business is built. And this is built, on the fundament of global digital business." [EMO's co-leader#1, 12/2015]

Affective Influence

The most important manifestation of the differences in EMO's and A-NE's mental models of implementation related to EMO's use of three affective influence tactics. The purpose of these tactics was to trigger affective reactions that would increase the targets' desire to invest in e-cars and collaborate with EMO. A-NE did not use affective influence practices.

Embodied affective influence practices. EMO's members made their potential collaboration partners engage in physical activities that we witnessed to trigger strong positive affective reactions in the individuals. These positive affective reactions seemed to get associated with both e-cars and the representatives of EMO. EMO's co-leader explained their focus on embodied practices: "We've been trying to get rid of PowerPoints. We've had a few themes, one of which is that we do concrete things, we bring the cars on the streets, we bring the charging devices on the streets, and we'll try them. That's a very important thing."

The most important embodied affective influence practice was test driving e-cars. Often, when EMO's leaders had a meeting with an established or a potential collaboration partner, they organized a test drive in the same occasion. They did deliberately with the goal of generating positive reactions: "With e-cars, we are not there yet that people believe that it is the right solution. We need to do convincing. For that, I believe that instead of doing a lot of this political talking, we should put the real decision-makers drive the e-cars. Get the experience and realize that you can use it in real life." [Co-leader of EMO, 5/2013] These test drives typically triggered positive affect toward the e-car. In contrast to EMO, A-NE did not organize test drives even though they would have had equal opportunities for doing so.

Use of diverse metaphors to trigger affective reactions. EMO's leaders often described e-cars and associated infrastructure and activities with affect-eliciting metaphors. They triggered positive affect toward e-cars and negative affect toward internal combustion engine cars: Twenty years ago, we would have been allowed to smoke inside in this seminar room. It would have been considered normal that we breathe the poisonous smoke. In 10 to 15 years, we will feel similarly absurd, when we think back and remember how we allowed our kids to inhale the exhaustion fumes of internal combustion engine cars in our cities." [EMO's co-leader#2 opening a seminar for 70 people, 5/2013] When observing the reactions of about 100 individuals to EMO's metaphors over time, we saw that they reacted affectively to the metaphors in the particular situations that the metaphors were introduced.

In contrast, A-NE's leaders used very few if any metaphors. We observed A-NE's leaders in over 20 meetings and presentations and did not see or hear them use concrete metaphors that would have triggered affective reactions. Their communication partners and audiences typically displayed calmness rather than affective reactions in their non-verbal reactions.

Generating perceptions of involvement. As a third affective influence practice, EMO's leaders gave their established and potential collaboration partners the impression that the partners could influence how things will evolve. In contrast to EMO's approach, A-NE's leader was explicit that he has already created a grand-design for the ecosystem and that other organizations should act as he suggests for everyone's benefit.

Actors' Perceptions of Focal Firm and New Technology

The affective influence practices used by EMO seemed to make the potential partners associate positive affect with EMO and e-cars and, consequently, develop more positive perceptions about EMO than about A-NE. These perceptions, in turn, influenced the different organizations' choices between EMO and A-NE as a collaboration partner.

Perceptions of substance area passion. One source of uncertainty in collaboration relates to the potential partners' motives for operating in the novel technological area. Some companies might be opportunistically involved to benefit from the hype and related relatively bountiful funding, while others might be genuinely passionate about the technology itself. Potential partners perceive companies who display genuine passion as more predictable because they are less likely to abandon the focal area for another opportunity than those companies who are more motivated by the (uncertain) financial opportunity provided by the novel technology. Companies therefore likely favor passionate collaboration partners over others. As a government official responsible for funding e-car related projects in Finland revealed: "A consortium [of many companies for promoting e-car business] requires.. If you think about it after the fact [which companies we have selected], it requires that the coordinator must have a reasonably.. I don't know what word to use. A certain kind of passion anyway, and the motivation." [2012]

Affective influence tactics seemed to influence potential collaboration partners' perceptions such that they perceived EMO as more passionate about e-cars than A-NE. People typically experienced pleasant affect with EMO's representatives when talking about e-cars. They also experienced negative affect together with EMO's leaders toward internal combustion engine cars and the oil industry. These affective reactions seemed to associate with the individuals and their organizations, creating perceptions that they are passionately promoting e-cars for the sake of the general benefits that they provide (rather than for private profit). For example, "[EMO's co-leader #1]

is a true believer in e-cars. He really wants to make this [e-cars in Finland] real and his doing everything that is possible to make it happen. […] He thinks that it [transition to e-cars] will benefit the whole world." [Manager from EMO's collaboration partner]

In contrast, people generally did not feel positive affect with A-NE's leaders. Rather, they perceived that A-NE's leaders were more calculative and not passionate about the e-cars: "I don't think [A-NE's leader] wants to make this real. He's in just to get government money. He's like parasite; he just takes a topic which allows him to get money from the government. He's not really trying to do anything." [Consultant about A-NE's leader, 7/2012]

"Doer" versus "talker" perceptions. A second factor that can have high relevance for selecting collaboration partners under high uncertainty is the partners' propensity for action. In collaborative settings, value is assumed to be created through mutually reinforcing actions and a focal company's efforts may be wasted if their partner does not implement their part effectively. Hence, companies are likely to evaluate if their potential collaboration can get things done instead of making empty promises.

There were differences in the potential partners' perceptions of the core firms' propensity for action. EMO was perceived as a "doer" and A-NE as a "talker". The "doer" perception refers to viewing the focal entity as able to generate action and concrete results, whereas the "talker" perception refers to viewing the focal entity as only talking about things without making concrete progress.

Perceptions of the potential and meaningfulness of the novel technology. Companies' decision to invest in any particular technology can be influenced by their perception of the general economic potential of the technology and its meaningfulness. EMO's affective influence practices seemed to lead to more positive views on the potential and meaningfulness of the e-car industry. Given this positive excitement, they expressed more willingness to contribute their time and effort into creating the e-car ecosystem in Finland, as a member of EMO's ecosystem.

In contrast, lacking affective excitement about e-cars, A-NE's partners did not experience such meaningfulness and were less proactive. Some started doubting the benefits of e-cars.

Development of Inter-Firm Collaboration Relationships

When EMO and A-NE started competing for collaboration partners, they had roughly similar conditions: both had high intellectual resources, government support, and a promising set of initial partnership deals. However, EMO was able to attract more collaboration partners whereas A-NE started losing its collaboration partners. Some companies that had initially worked with A-NE defected to work with EMO. EMO's partners also got more active in their collaboration whereas A-NE's remaining partners reduced their involvement. Affective influence practices partly influenced these choices by influencing the perceptions that other actors formed about A-NE and EMO—actors started favoring EMO over A-NE because they perceived EMO and EMO's prospects more positively.

A-NE's situation started getting worse already in late 2010. It started losing its partners one by one, and also some key individuals left the company. A-NE reduced its involvement with e-cars. A-NE's second-in-command reflected in May 2013, "Not much has happened around the [e-car project]." The lack of developments made it less attractive as a collaboration partner for other companies. A-NE moved to a smaller office to cut costs in 2013. Their e-car operations remained modest in 2014-2015.

In contrast, while A-NE struggled, EMO's collaboration network continued growing. EMO's co-leader #1 described in June 2012 that things were progressing well. In September 2012, EMO organized the opening of Finland's first fast charging station in City#1 (which had started collaborating with EMO, while reducing involvement with A-NE) and announced that they would build a Finland-

wide fast-charging network with a gas-station chain (the implementation progressed as announced). In June 2013, EMO announced a large collaboration agreement. In October 2014, this company further announced that it had sold a license abroad and thus taken a crucial first step in generating international business, which had been EMO's goal from the beginning. The positive developments continued in 2015 with new charging stations and increased customer numbers, with most of the revenue now coming from the international markets. As EMO's business grew, it became an even more attractive partner for other companies.

DISCUSSION

We studied two companies—EMO and A-NE—which sought to build new collaboration networks around new technology. While they had similar visions of the future of the industry, they differed in what we call their mental models of implementation. EMO's mental model of implementation was based on the assumption that people are substantially influenced by their affective reactions, whereas A-NE's assumed that facts and logic drive people's behaviors. EMO consequently used various affective influence practices whereas A-NE did not. The affective influence practices carried out by EMO led to changes in potential partners' perceptions of EMO in the emerging Finnish electric car industry. These affective reactions made potential partners favor EMO over A-NE. EMO thus increased the size of its collaboration network and became a more attractive partner for other companies too.

Previous research on collaboration development has highlighted how social embeddedness and resources influence the evolution of partnership networks in a deterministic fashion (Granovetter, 1985; Gulati & Gargiulo, 1999). That is, most previous theory describes self-reinforcing patterns of a virtuous cycle where the "rich get richer". However, this earlier research sheds less light on the early stages of inter-firm collaboration, where there is still high uncertainty regarding which technologies and companies will prosper and which will not. We found that affective influence practices have a particularly strong role during these early stages, as uncertainty makes it difficult for organizations to use more analytical approaches for choosing with whom to collaborate. Affective influence can generate reactions that tilt the potential partners' assessment toward favoring the focal organization; and when many enough organizations join for this reason, the partner-network likely reaches a critical mass and continues growing due to the hard reasons recognized by earlier research.

Affective reactions have such a crucial role because people often use (consciously or not) their affective reactions as cues under high uncertainty, such that positive affective states associated with entities trigger more positive evaluations along several dimensions and negative affective states trigger more negative evaluations (e.g., Damasio, 1994; Kahneman, 2011). Affective influence practices that generate affective reactions that are not fully integrated to the actual business situation may be sufficient for these outcomes because spatial and temporal association between an affective state and an object is often sufficient for associating the affect with the object, even if the real cause was elsewhere (Niedenthal & Brauer, 2012; Russell, 2003).

REFERENCES AVAILABLE FROM THE AUTHORS