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Entrepreneurship and Innovation in Nascent Industries

A dissertation presented
by
Tiona Zuzul
to
The Strategy Unit

in partial fulfillment of the requirements
for the degree of
Doctor of Business Administration
in the subject of
Strategy

Harvard Business School
Boston, Massachusetts

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Entrepreneurship and Innovation in Nascent Industries

Abstract

This dissertation explores the activities entrepreneurs undertake when launching ventures and innovating in new or *nascent* industries. Actors in nascent industries can play a vital role in shaping the future. Yet the features of a nascent context can also lead to failures. I describe three empirical studies that involved significant time in the field studying the development of ventures in two contemporary nascent industries: the smart city industry and the air taxi industry. In each study, I draw on several theoretical lenses, integrating perspectives from psychology, behavioral strategy, and institutional entrepreneurship to build new, grounded theory on the processes that underlie entrepreneurship and innovation in nascent industries. The key insight of this dissertation is that, because of the extreme ambiguity that characterizes the context, entrepreneurship in nascent industries represents a unique – and uniquely challenging – balancing act. I propose that, in nascent industries, the way that entrepreneurs think, feel, and interact in the face of profound ambiguity can shape the success or failure of their ventures. This dissertation aspires to make contributions to two literatures. By focusing on internal firm processes that affect success, I contribute to a new, and rapidly evolving, research conversation on entrepreneurship in nascent industries. By uncovering the importance of previously-unidentified cognitive and emotional patterns and mechanisms in driving firm performance, I contribute to the growing stream of research in behavioral strategy.

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– Pobratimstvo Lica u Svemiru, Tin Ujević, 1891 – 1955

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CHAPTER ONE

ENTREPRENEURSHIP AND INNOVATION IN NASCENT INDUSTRIES:

AN INTRODUCTION TO THE RESEARCH AGENDA

"At the time, the niche didn't exist. *There was no market*…. We are sending everybody on a journey of what a smart city could be. And *nobody knows what a smart city is*." – Interview with SusTech executive, June 2010

1.1 Introduction

Most entrepreneurs launch new ventures hoping to build a successful business. Yet in some instances, their efforts spark the development of something larger than the business itself. When entrepreneurs found organizations offering products or services that defy existing industry categories – ones that cannot be classified as belonging to an established industry – they can help give rise to entirely new industries: intentionally or accidentally; immediately or gradually. Thomas Edison launched not just a company but also an industry when he developed and commercialized a system of electric lighting (Hargadon and Douglas, 2001). Alexander Graham Bell's founding of Bell Telephone gave rise, eventually, to a telecommunications industry that did not exist before his firm was formed (Bruce, 1990). Recently, executives from technology and real-estate hybrids including SusTech have launched projects that are beginning to constitute a new *smart cities* industry.

Actors in new or *nascent* industries play a vital role in shaping the future. The activities of such pioneers can influence the industry for years and even decades: their successes become models to emulate; their failures tripwires to avoid. The path-dependent nature of industry evolution (Hannan and Freeman, 1989) ensures that pioneers' steps and missteps can set a trajectory for the development of the entire industry. In the early 20th century, for instance, the failure of early electric vehicle companies set the stage for the rise of gasoline automobiles, and shaped the modern automobile industry as we

know it (Kirsch, 2000; Kirsch and Mom, 2002). The "fate" of early electric vehicle companies, Kirsch and Mom (2002) wrote, "took with it a particular alternative vision of personal mobility" (78).

Despite its importance, entrepreneurship in nascent industries has only recently become a distinct topic of scholarly inquiry. Writing twenty years ago, Adrich and Fiol (1994) argued that, "early ventures in the formative years of a new industry face a different set of challenges than those that simply carry on a tradition pioneered by thousands of predecessors in the same industry" (645). Nevertheless, most research in nascent industries has not explored the processes through which entrepreneurs respond to these challenges, and has instead focused on industry-level dynamics. Evolutionary economists and strategists have studied the paths by which industries develop (e.g. Klepper and Graddy, 1990; Klepper, 1997), whether firms enter, when they enter, and how entry and survival rates are related (e.g. Mitchell, 1989; Mitchell, 1991; Klepper and Simons, 2000; Dowell and Swaminathan, 2006; Bayus and Agarwal, 2007). Technology management scholars have explored how technological changes give birth to and shape early industry structures (e.g. Abernathy and Utterback, 1978; Tushman and Anderson, 1986). Population ecologists have focused on how forces at the level of the field, typically exogenous from the activities of particular entrepreneurs, shape the development of new industries (e.g. Hannan and Carroll, 1992; Hsu and Hannan, 2005; Hannan, Pólos, and Carroll, 2007). As a result, as Forbes and Kirsch (2011) wrote more than 15 years later, "little is known about key *processes* that unfold in this context" (590; emphasis added).

A small but growing number of studies have focused empirically on the activities of new ventures in nascent industries (e.g. Gavetti and Rivkin, 2007; Santos and Eisenhardt, 2009; Navis and Glynn, 2010). Although these studies have made important contributions, the field itself is nascent; much remains to be uncovered. In particular, scholars studying entrepreneurs in nascent industries typically adopt distinctive theoretical positions; they thus focus on narrow slices of entrepreneurial action. Those studying strategy focus on entrepreneurs' competitive activities (e.g. Santos and

Eisenhardt, 2009); those studying institutional entrepreneurship on their efforts at symbolic management (e.g. Navis and Glynn, 2010); those studying institutional fields on the collective activities they undertake to build a new industry (e.g. Rao, Morrill, and Zald, 2000). As a result, most existing research does not consider the potential interactions of these processes. The field is left with propositions to help entrepreneurs in nascent industries, among others, help construct market boundaries to their advantage (Santos and Eisenhardt, 2009) or build legitimacy for a new industry (Navis and Glynn, 2010), but without few theories about the complexities inherent in their tasks.

By exploring internal, individual and firm-level processes – and by accounting for their interactions and complexities – this dissertation contributes to the new research conversation on entrepreneurship in nascent industries. My research has included significant time in the field studying the development of ventures in two nascent industries. I draw on several theoretical lenses, integrating perspectives from psychology, behavioral strategy, and institutional entrepreneurship to build new, grounded theory on the processes that underlie entrepreneurship and innovation in this context. The key insight of this dissertation is that entrepreneurship in nascent industries represents a unique – and uniquely challenging – balancing act. Entrepreneurs in nascent industries undertake different activities than those in mature industries; they face different and unexpected temptations; the strategies and internal firm dynamics that work well in a mature setting can lead to their downfall. I propose that, in this context, the way that entrepreneurs think, feel, and interact in the face of profound ambiguity can profoundly shape the success or failure of their ventures.

This dissertation is organized as follows. In the remainder of this chapter, I review the current literature on the challenges of nascent industries. Entrepreneurs in nascent industries navigate a context fraught with ambiguity. They face ambiguity about what to produce and how and for whom to produce it (Kaplan and Tripsas, 2008). At the same time, their ventures and industries lack legitimacy, or the understanding and support of external stakeholders (Aldrich and Fiol, 1994). This chapter examines the

field's current understanding of each of these sources of ambiguity. I then report on three empirical studies – two in the smart cities industry and one in the air taxi industry – that explore the processes through which entrepreneurs respond to these challenges. In each chapter, I build testable theories to help entrepreneurs build thriving businesses in nascent industries.

1.1.2 The Emergence of Nascent Industries

Industries do not take shape all at once, but rather evolve through phases ranging from birth to maturity and (eventually) decline (Williamson, 1975; Klepper and Graddy, 1990; Klepper, 1997). Following the literature, I define an industry as one or more organizations offering products or services that are similar or potential substitutes for one another (Klepper, 1997). A new industry emerges when small numbers of both new and existing organizations begin developing substitutable products and services that defy existing industry categories; these products and services are usually based on new technologies, changed regulatory environments, or novel ideas about consumer demands (Williamson, 1975; Henderson and Clark, 1990; Klepper and Graddy, 1990; Klepper, 1997).

As Agarwal, Sarkar, and Echambadi (2002) pointed out, scholars from three distinct traditions – evolutionary economics (e.g. Klepper and Graddy, 1990), technology management (e.g. Abernathy and Utterback, 1978), and organizational ecology (e.g. Hannan and Carroll, 1992) – have shown that industries develop through life cycles. Although they have focused on different challenges, scholars from each of these traditions have argued that the essential features of a nascent industry, or the earliest stages of a new industry's development (Aldrich and Fiol, 1994; Aldrich and Ruef, 2006; Santos and Eisenhardt, 2009; Dobrev and Gotsopoulos, 2010; Benner and Tripsas, 2012), differ from those of a mature industry. Evolutionary economists have pointed out that nascent industries are characterized by entrepreneurs and organizations that enter and exit the fledgling industry rapidly (Klepper, 1997): product experimentation is high, and "competition based on product innovation is intense" (Klepper,

1997: 148). Scholars of technology management have shown that, because nobody knows what technologies will prove successful or what product features will appeal to consumers, there are no dominant designs (Abernathy and Utterback, 1978). Organizational ecologists have argued that, because of a lack of a dense population, firms in the industry lack legitimacy (Hannan and Carroll, 1992).

Research in each tradition has shown that, as an industry evolves, these problems abate. Firms in the industry begin to converge around particular products, business models, and dominant designs (Aberthany and Utterback, 1978; Klepper, 1997), and gain growing legitimacy (Hannan and Freeman, 1989; Hannan and Carroll, 1992; Hannan et al., 2007). When the industry reaches maturity, market share stabilizes, entry declines, product experimentation tapers, and organizations begin to focus on refining their management, marketing, and manufacturing techniques (Klepper, 1997). There is enormous range in the time required for industries to reach maturity; this evolution can last anywhere from two to 50 years (Klepper and Graddy, 1990).

What underlies the challenges described by each of these traditions is *ambiguity.* Entrepreneurs launching ventures in nascent industries face extreme ambiguity (Santos and Eisenhardt, 2009), which Weick (1995) defined as "an on-going stream that supports several different meanings at the same time" (99). Unlike uncertainty, or the inability to predict the probability of particular outcomes, ambiguity obscures cause-and-effect relationships so that possible outcomes themselves are unknown (March, 1994; Weick, 1995). Entrepreneurs in nascent industries face ambiguity around optimal ends, or *what* they should do (March, 1994), and ambiguity around optimal means, or the best *ways* they should do it (March, 1994). At the same time, their stakeholders – partners, financiers, customers –may not understand the industry or the potential for the products it offers (Aldrich and Fiol, 1994). Each of these sources of ambiguity – ambiguity of means, ends, and perceptions, illustrated in Table 1.1 – presents a distinctive challenge to entrepreneurial action, and all three are exacerbated by the rapid shifts a nascent industry can take: what value means, how it should be delivered, and how external audiences

perceive and respond to it can change in unexpected ways. Moreover, activities aimed at managing or resolving one source of ambiguity can have unintended consequences on the others. In the following sections, I expand on research on each of these challenges.

Table 1.1: The Ambiguity of Nascent Industries

	Ends	**Means**	**Perceptions**
Definition	Lack of clarity on *what* entrepreneurs should produce.	Lack of clarity on *how* entrepreneurs should deliver value.	Lack of clarity on whether and how external stakeholders will perceive and accept the industry.
Theoretical Tradition	Categories; technology management.	Evolutionary economics; strategy.	Organizational ecology; institutional entrepreneurship.
Source	No stable categories, or shared ideas about features that distinguish the industry.	No shared stocks of industry knowledge. No proven, well-understood customers. Fleeting producers, suppliers, partners. Untested technologies.	No legitimacy.
Response	Entrepreneurs rely on frames to define what to produce. Entrepreneurs attempt to actively construct categories by disseminating ideas about features that distinguish the industry. Entrepreneurs compete over their ideas about the features that distinguish the industry.	Entrepreneurs discover business models through experimentation and learning.	Entrepreneurs engage in efforts to build legitimacy.

1.1.3 Ambiguity of Ends: Categories in Nascent Industries

Entrepreneurs and organizations in a nascent industry lack well-understood or shared models or templates indicating *what*, precisely, they should produce. As a result, the industry's *categories* – the "conceptual boundaries that cluster easily substitutable [groupings]… and distinguish them from less substitutable groupings" (Rosa, Porac, Runser-Spanjol, and Saxon, 1999: 64) – are unstable. Neither producers nor consumers have clear conceptions of what features cluster or distinguish the industry's products (Rosa et al., 1999; Kennedy, 2008; Navis and Glynn, 2010; Granqvist, Grodal, and Woolley, 2013). For instance, in the nascent phases of the automobile industry, there was little agreement around what elements exemplified or distinguished the automobile category – Was it their design? Their source of power? Or some other feature?– and what elements would be important in its future development. As Rao (1994) wrote of the nascent automobile industry, "the only point of agreement about the automobile was that it could not be powered by animals" (33).

As a result, entrepreneurs in nascent industries face ambiguity about the *ends* they should strive for (March, 1994); that is, about the products and services they should aim to deliver. As scholars of technology management have pointed out, because categories are unstable, it is unclear what constitutes value (Kaplan and Tripsas, 2008; Benner and Tripsas, 2012): entrepreneurs must make sense of multiple and sometimes conflicting interpretations of what the product is, how it will be used, and what core attributes will resonate with consumers (Kaplan and Tripsas, 2008). For instance, in the nascent phases of the automobile industry, entrepreneurs in Europe conceptualized automobiles as "road locomotives" while entrepreneurs in the United States conceptualized them as "horseless carriages" (Langlois and Robertson, 1989: 366). Each of these categorizations drove different ideas about what features would distinguish automobiles from other modes of transportation, and what design choices customers would value. Thus, while entrepreneurs in Europe focused on developing a smooth, comfortable ride akin to a locomotive, those in the United States focused on developing an

alternative to the horse – eventually, the internal combustion engine (Langlois and Robertson, 1989). These priorities resulted in different products that attracted different customers.

Given this ambiguity, entrepreneurs' categorizations and conceptions of value are driven by their *frames:* "schemata of interpretation which allow actors to make sense of ambiguous and varied signals" (Kaplan, 2008: 732). Frames – interpretive schemes imparted by prior experience (Goffman, 1974) – shape how entrepreneurs see the world: both what they notice and how they make sense of it (Kaplan, 2008). By affecting the opportunities they perceive and the analogies they draw on (Gavetti, Levinthal, and Rivkin, 2005), actors' different frames can shape divergent ideas about a nascent industry and the products it should offer (Kaplan and Tripsas, 2003; Benner and Tripsas, 2012). For instance, in the nascent digital camera industry, photography firms framed digital cameras as analog camera substitutes; consumer electronics firms framed them as video system components; and computing firms framed them as PC peripherals (Benner and Tripsas, 2012). Each of these frames resulted in different conceptions of value and hence product features. In the earliest phases of a nascent industry, these different frames compete against one another in the marketplace; as the industry evolves, producers begin to converge on the frame that resonates with consumers, and a stable category – a shared understanding of what, for instance, an automobile or a digital camera is – emerges (Kaplan and Tripsas, 2008).

A lack of stable categories and resulting ambiguity shape entrepreneurial activities in two ways. First, as research in institutional entrepreneurship has shown, entrepreneurs often actively attempt to construct categories around their industry. For instance, Khaire and Wadhwani (2010) described how Saffronart, an auction house, attempted to shape the category of Indian modern art by introducing buyers to a set of key constructs that both clustered 20th century Indian paintings and distinguished them from other works of art. In their study of the nascent satellite radio industry, Navis and Glynn (2010) showed how Sirius and XM developed ideas about what satellite ratio was and was not; in the

earliest days of the industry, rather than attempting to compete by distinguishing their own firms, the companies focused their attention on fostering this collective identity and differentiating the industry as a whole. Only once the industry category had stabilized did they begin to differentiate themselves from one another.

Second, as strategy and technology management scholars have shown, entrepreneurs also compete over their different conceptions of value, and actively attempt to become the category referent: the producer that exemplifies what the category means (Santos and Eisenhardt, 2009; McDonald and Eisenhardt, 2013). For instance, early biotechnology entrepreneurs framed the industry's products in different ways, and engaged in contests to construct ideas about what biotechnology was (Kaplan and Murray, 2008). Similarly, Santos and Eisenhardt's (2009) study of five firms in nascent internet markets showed how the most successful firms attempted to "claim the market" by "defining a distinct identity for the firm and market so the two become synonymous" (649) – through, for instance, adopting well-known templates from existing industries, disseminating elaborate stories, and signaling leadership through activities including the distribution of best practice frameworks. Thus, unlike entrepreneurs in mature settings, individuals launching businesses in nascent industries must confront a lack of stable categories and ambiguity of ends; they often do so through active efforts to both shape and compete over different conceptions of value.

1.1.4 Ambiguity of Means: Business Models in Nascent Industries

In a nascent industry, there are also no established, successful organizations enacting business models that entrepreneurs can imitate or improve. In a mature industry, entrants can learn by drawing on established stocks of industry knowledge (Agarwal et al., 2002) through, for instance, imitation (Rivkin, 2000). In contrast, entrepreneurs in a nascent industry must act as innovators who develop new business models, or who import or recombine models from other industries (Gavetti et al., 2005;

McDonald and Eisenhardt, 2013). What business model elements will lead to success, however, is unclear. As research in evolutionary economics and strategy has shown, the industry lacks proven customers with clear preferences and well-understood willingness-to-pay (Rindova and Fombrun, 2001; Santos and Eisenhardt, 2009). Suppliers and partners are undefined and often fleeting, and technologies are untested (Rindova and Fombrun, 2001). Thus "executives in new markets may have difficulty identifying the relevant foils for comparison (since competitors are unclear) and the relevant dimensions on which to differentiate (since customers and products are unclear)" (McDonard and Eisenhard, 2013: 4).

As a result, entrepreneurs in nascent industries face ambiguity around the *means* by which to achieve their ends (March, 1994): they must make sense of multiple, untested interpretations about how value should be delivered. For instance, in the early days of the internet portal industry, firms like Yahoo!, Lycos, and Excite developed different business models. In particular, their funding sources ranged from charging customers for searches, to subscription fees, to licensing technology to corporate customers (Gavetti and Rivkin, 2007). As the industry matured, certain models proved more effective than others; by 1996, they industry began to stabilize around the advertising revenue model search engines currently take for granted (Gavetti and Rivkin, 2007).

A small but growing stream of research has shown that, because of this ambiguity, successful entrepreneurs in nascent industries discover effective business models through experimentation and learning. Gavetti and Rivkin's (2007) study, for instance, showed that young firms in nascent industries shift elements of their models rapidly through trial-by-error learning rather than through rational search mechanisms. McDonald and Eisenhardt's (2013) study of entrepreneurs in the nascent on-line investment market suggested that successful firms test their business model assumptions to enable rapid learning; they also remain flexible to accommodating new, unanticipated opportunities that emerge as the industry shifts. Even in mature industries, successful entrepreneurs often test different

value propositions and business models, then morph and adapt based on market feedback (Brown and Eisenhardt, 1997; Bhide, 2000; Rindova and Kotha, 2001). Thus, although research on business model development in nascent industries is sparse (McDonald and Eisenhardt, 2013), it points to discovery, experimentation, and learning as the critical processes enabling success.

1.1.5 Ambiguity of Perceptions: Legitimacy in Nascent Industries

Finally, as scholars of organizational ecology have argued, a nascent industry lacks the implicit endorsement and support of external stakeholders who take its existence for granted (Hannan and Freeman, 1989; Hannan and Carroll, 1992). Customers and other stakeholders are at best unaware of and at worst skeptical about the new products and services firms in the industry offer. The firms thus lack *legitimacy*, or the general perception that an entity conforms to "socially constructed system of norms, values, beliefs, and definitions" (Suchman, 1995: 574). Legitimacy is an important concern for all new firms – their success depends on the extent to which stakeholders understand and accept their activities, products, and business models – but especially for new firms in nascent industries, which lack the endorsement granted to firms that follow a path tread by hundreds or thousands of predecessors and contemporaries (Aldrich and Fiol, 1994; Rao, 1994; Lounsbury and Glynn, 2001; Dobrev and Gostopouls, 2010).

Entrepreneurs in nascent industries thus face ambiguity around whether and how external stakeholders will perceive their industries and firms, and are likely to confront multiple interpretations about the role they should play in building legitimacy. A long tradition of institutional and organization ecology research has shown that legitimacy often emerges over time, as audiences develop clear expectations for the products, services, and activities firms in the industry should enact (e.g. Hsu et al., 2009). This emergence is often spearheaded or encouraged by the activities of institutional actors. In particular, research has shown that social movements can give rise to new values that support and help

legitimate new kinds of organizations, products, and services (e.g. Lounsbury, Ventresca, and Hirsch, 2003; Greve, Posner, and Rao, 2006; Haveman, Rao, and Paruchuri, 2007). For instance, Sine and Lee (2009) showed how entrepreneurs in the nascent U.S. wind energy sector benefitted from the earlier activities of environmental groups that constructed and propagated cognitive frameworks, norms, values, and regulatory structures and legitimized the use of wind energy.

A smaller but growing stream has emphasized that legitimacy is something that entrepreneurs in nascent industries can proactively build (Aldrich and Fiol, 1994; Kennedy, 2008; Navis and Glynn, 2010). In this view, entrepreneurs "must build a reputation of the new industry as a reality, as something that naturally should be taken for granted by others" (Aldrich and Fiol, 1994: 657), in order to attract employees, customers, and capital. They must act as cultural entrepreneurs (Lounsbury and Glynn, 2001) who produce and disseminate defining stories that "outline their… core purpose and practices, theorizing their meaning and appropriateness" (Wry, Lounsbury, and Glynn, 2011: 450).

Building legitimacy involves two broad classes of activities. First, entrepreneurs must develop a collective identity that meaningfully labels and defines firms in the industry; they must then disseminate that identity to stakeholders outside the industry (Navis and Glynn, 2010; Wry et al., 2011). Entrepreneurs accomplish the first task by creating stories through collective, inter-industry activities including the formation of associations that shape common identities and practices (David, Sine, and Haveman, 2012); the most effective stories draw on established cultural elements to frame the new industry as familiar and thus desirable (Hargadon and Douglas, 2001; Khaire, 2013). They accomplish the second by engaging in efforts to spread and disseminate these stories through activities including press releases, speaking engagements, and publicized ceremonies (Rindova, Petkova, and Kotha, 2007).

These tasks are often related to entrepreneurs' efforts to shape categories. Through engaging, for instance, in efforts to build a collective identity, entrepreneurs can both construct categories – that is, begin to define what firms in the industry should strive to produce – and set the stage for growing

legitimacy. For instance, in the nascent phases of the satellite radio market, the activities of Sirius and XM – their identity claims, linguistic framings, and announced affiliations – focused on emphasizing a collective, shared sense of what all firms in the market do and who they are; through these activities, Sirius and XM helped foster a collective identity that stabilized industry categories (Navis and Glynn, 2010). By disseminating the stories through press releases and media activities, they also helped build legitimacy for the nascent market (Navis and Glynn, 2010). Thus, unlike entrepreneurs in mature settings, individuals launching businesses in nascent industries must confront a lack of legitimacy; they often do so through efforts to create a collective identity and actively build legitimacy.

1.2 This Dissertation

Research on nascent industries has largely considered each of these challenges – ambiguity of ends, means, and perceptions – in isolation, and has not explored whether and how entrepreneurs respond to multiple sources of ambiguity at the same time. By exploring the processes, interactions, and tensions that unfold within firms and ventures in a nascent industry, this dissertation aims to address this gap. I study the activities of entrepreneurs as the industry around them unfolds in a grounded, in-depth way; in so doing, I build actionable propositions about the processes and factors that lead to success. This dissertation suggests that the challenges ambiguity presents to entrepreneurs in nascent industries are non-additive; facing them simultaneously creates a challenge greater than the sum of their parts. Launching ventures and innovating in nascent industries is perhaps best characterized as a delicate balancing act: to succeed, entrepreneurs must manage multiple sources of ambiguity, taking care that the processes directed at one do not derail progress on the others.

In first of three empirical studies in this dissertation, “Framing Clashes: Divergent Frames and Negative Emotions in a Nascent Industry,” I consider an interaction between competition and collaboration. As noted, because they lack stable categories, entrepreneurs in nascent industries often

compete over their different conceptions of value – producing, for instance, different versions of digital cameras (e.g. Benner and Tripsas, 2012). But category-defying products and services often result from the recombination of knowledge from multiple existing industries (e.g. Hargadon, 2003); entrepreneurs in nascent industries must often collaborate on a single project or venture with individuals from different backgrounds, and hence with different conceptions of value. What happens when frames, or ideas about what we should be producing, diverge in a single venture? How can entrepreneurs balance the tension between diversity, which can result in innovation, and divergent frames, which can result in excessive competition?

I explored these questions through a longitudinal, qualitative study of two large-scale innovation projects involving hundreds of individuals from 19 organizations operating in the nascent smart cities industry. Some of these organizations have long histories and simultaneously operate in mature industries; others are brand new and taking shape as the nascent industry in which they compete takes shape. I find that, because of the ambiguity of their context, individuals collaborating on these projects experienced strategic disagreements that reflected their divergent perspectives on the project and the nascent industry itself. These disagreements evoked emotional processes that spiraled downward to derail the projects. I elaborate the concept of *framing clashes* to show how these processes unfold.

This study suggests that the challenge of ambiguous contexts and nascent industries is not solely cognitive; instead, cognition and emotion can intertwine in ways that are fatal for innovation. By uncovering this process, I begin to suggest ways that entrepreneurs in nascent industries can manage the tension between collaboration and competition, and add to literatures on innovation, behavioral strategy, and emotions in strategy.

In the second empirical study, "The Downside of Legitimacy Building for a New Firm in a Nascent Industry," conducted with Amy Edmondson, we explored the interaction between learning and legitimation. The second challenge of nascent industries – ambiguity of means – calls for an

experimental, internally-focused approach; entrepreneurs must continually probe their unfolding environment to learn about the best ways to deliver value. At the same time, the third challenge – a lack of legitimacy – calls for deliberate, externally-focused activities; entrepreneurs must create and disseminate stories to build legitimacy. The two sets of activities call for a fundamentally different approach to the firm and its environment: learning requires continual inquiry, legitimacy-building continual advocacy. What happens when entrepreneurs pursue both? Does one set impede the other?

We report on a three-year case study of a firm in the smart cities industry to illuminate how entrepreneurs' efforts to legitimate a firm and a nascent industry affect the internal development of the firm. We find that firm leaders engaged in a set of legitimation activities to lower ambiguity about the firm and industry. These activities had unintended consequences that affected the firm's ability to learn: they left employees constrained in their ability to attend to, reflect on, and dynamically respond to information and changes in their environment. Prior research has emphasized the importance of legitimation in a nascent context, yet studies have not recognized how legitimation activities influence key cognitive processes like reflection and flexible thinking. By exploring the dark side of legitimation, our research builds actionable propositions to help manage the tension between learning and legitimation.

Finally, in the third empirical study, "Shaping and Experimentation in a Nascent Industry," conducted with Mary Tripsas, we build theory on the interaction between all three challenges: unstable categories, a lack of successful business models and precedents, and the absence of legitimacy. Addressing these challenges calls for different entrepreneurial activities. To actively manage two – unstable categories and the absence of legitimacy – new firms must focus on activities aimed at shaping their emerging industry. To actively manage the third – a lack of business models and precedents – they must focus on activities aimed at experimenting with and building their own firms. What determines the activities entrepreneurs focus on? What are the trade-offs they face?

To explore these questions, we analyzed the entire history of four new firms in the nascent *air taxi* market. We discovered that founders fell into two general categories: those with *visionary mindsets*, who saw themselves as pioneers and sought to create a new market, and those with *opportunist mindsets*, who sought to exploit an opportunity created by the development of new technologies. We found that, while firms launched by visionary founders focused on shaping their industry, those launched by opportunist founders engaged in experimenting with their models. We found that engaging in shaping activities had unexpected negative consequences. We thus propose that the fate of firms with visionary founders will have a high variance compared to that of those with opportunistic founders. If the founder's vision comes to fruition, the firms can be a "home run" that comes to epitomize a new industry. However, since investment into shaping can leave the firms unable to adapt to or experiment in a highly ambiguous, rapidly shifting context, the probability of failure is also higher.

Together, these studies reveal the processes that can lead to entrepreneurial success and failure in nascent industries, and underline the importance of individual-level mechanisms and factors. By illuminating these processes, this dissertation points towards actionable propositions to help entrepreneurs launch and lead ventures that can thrive in the face of profound ambiguity; theoretically, it underscores the importance of treating this topic as a unique – and uniquely complex – focus for organizational research.

CHAPTER TWO

FRAMING CLASHES: DIVERGENT FRAMES AND NEGATIVE EMOTIONS IN A NASCENT INDUSTRY

2.1 Introduction

To innovate, individuals working on projects with radically novel aims – those seeking to tackle an unprecedented social problem (Edmondson and Rashid, 2012), introduce a new product class (Tushman and O'Reilly, 1997), or help give rise to a nascent industry – must navigate a context fraught with ambiguity. Individuals working on such projects lack proven models, templates, or well-known paths to success; the connections between causes and effects, actions and outcomes are unclear and open to interpretation (March, 1994; Weick, 1995). These projects can produce tremendous results: awe-inspiring rescue efforts (Edmondson and Rashid, 2012), new categories of products, novel methods for building sustainable communities. But to succeed, the actors developing them must make strategic decisions both without the benefit of shared models, and despite multiple and potentially conflicting interpretations of what success means (Weick, 1995). Doing so can be difficult.

In this study I build new theory on why innovation under conditions of extreme ambiguity – in settings like nascent industries – can be so difficult. I propose that, in these settings, strategic disagreements about a project can evoke emotional processes that spiral downward to derail innovation. I elaborate the concept of *framing clashes* to show how, when *frames* or interpretations about a project's purpose clash around a strategic decision, negative emotional, cognitive, and relational processes unfold. In doing so, I highlight the emotional underpinnings of strategic decision-making in nascent industries. This chapter suggests that the challenge of ambiguous contexts is not solely cognitive, as existing literature suggests; instead, cognition and emotion can intertwine in negative spirals that threaten innovation.

The remainder of this chapter is organized in four sections. First, I briefly review perspectives on ambiguity and frames, and the impact of emotions in strategy and organizational outcomes. I then describe the two projects and outline the qualitative methods that gave rise to this analysis. In the results section, I focus on exploring ambiguity, frames, and emotions at SusTech City and GreenMarket. Finally, I discuss the implications of my findings for research on behavioral strategy and innovation.

2.1.1 Ambiguity and Cognitive Frames

Innovation projects in nascent industries are characterized by high ambiguity: that is, a lack of clarity about the meanings of and connections between causes and outcomes (March, 1994; Weick, 1995). Individuals innovating in projects that introduce a new product class, open a new market, or help give rise to a nascent industry lack stable categories or templates (Rosa et al., 1999). They thus face unclear or murky goals and purposes; they might form vague or competing definitions of what success means; they might rely on different professional understandings and values to help them make sense of what can and should be done (McCaskey, 1982).

In the absence of clear information and causal relationships, individuals rely on their frames to guide action and decision-making (Walsh, 1995). Since the seminal work of scholars writing in the Carnegie tradition (Simon, 1947; March and Simon, 1958; Cyert and March, 1963), researchers have emphasized that individuals construct simplified interpretations about the meaning, causes, and effects of ambiguous situations (March, 1994; Weick, 1995). Borrowing from literature on social movements (Goffman, 1974; Benford and Snow, 2000), researchers in behavioral strategy have argued that frames – action-oriented filters that highlight certain aspects of situations while hiding others – shape individual decisions and organizational outcomes (Kaplan, 2008). By "punctuating and encoding objects, situations, events, experiences, and sequences of action within one's present or past environment," frames help individuals filter, order, and make sense of new or ambiguous situations and contexts (Benford and

Snow, 1992: 137). Once constructed, frames guide attention and decision-making (Daft and Weick, 1984; Barr, Simpert, and Huff, 1992): they determine what information individuals pay attention to (Nisbett and Ross, 1980), limit the solutions that they consider (Cyert and March, 1963; Barr *et al.*, 1992), and shape their interests and preferences (Kaplan, 2008). By ordering, simplifying, and constricting situations and contexts, frames can both encourage and inhibit strategic action (e.g. Tripsas and Gavetti, 2000; Marcel, Barr, and Duhaime, 2011).

In projects characterized by high ambiguity, including those in nascent industries, individuals from different professions and backgrounds might rely on divergent or incompatible frames to guide decisions. This is because new situations, contexts, and goals are typically recognized and interpreted in terms of familiar ones (Rosch, 1978; Lakoff, 1987; Gavetti et al., 2005; Gavetti, 2012). Frames are thus shaped by historical experience; they can depend on dominant logics (Prahalad and Bettis, 1986), or individuals' thought-worlds (Dougherty, 1992), and educational (Fiss and Zajac, 2004) and occupational (Orlikowski and Gash, 1994; Leonardi, 2011) backgrounds. Individuals from similar industries, with shared experiences, beliefs, and logics, thus often bring similar frames to the same ambiguous situation or nascent industry (Huff, 1982; Porac, Thomas, and Baden-Fuller, 1989; Spender, 1989; Porac, Thomas, Wilson, Paton, and Kanfer, 1995). Conversely, individuals from different professions and industries bring divergent and sometimes incompatible frames (Collins and Pinch, 1982; Orlikowski and Gash, 1994; Kaplan and Tripsas, 2008; Benner and Tripsas, 2012). For instance, lacking stable templates or categories around the nascent digital camera market, leaders of photography firms viewed digital cameras as analog camera substitutes; leaders of consumer electronics firms viewed them as video system components; and leaders of computing firms viewed them as mini-computers (Benner and Tripsas, 2012). These divergent frames shaped product choices and strategies in the new market (Benner and Tripsas, 2012).

When individual differences result in divergent frames, decision-making and collaboration can become complicated (Orlikowski and Gash, 1994; Kaplan, 2008). Differences in profession, background, and industry experience are often described as key ingredients to innovation. Diverse experts bring unique knowledge to a task, and the re-combination of this knowledge can result in new connections and outcomes (Schumpeter, 1934; Henderson and Clark, 1990; Brown and Duguid, 1991; Leonard-Barton, 1995; Hargadon, 2003; Hargadon and Bechky, 2006). Differences in backgrounds can increase diversity of viewpoints, thereby promising more effective decisions (Janis, 1982; Schweiger, Sandberg, and Ragan, 1986). But if differences result in divergent frames, individuals may not be able to agree on acceptable courses of action (Kaplan, 2008). To make progress, leaders and managers in nascent industries must therefore resolve incompatible frames; they can often do so by engaging in framing contests aimed at developing shared frames to help guide decisions (Kaplan, 2008; Kaplan and Orlikowski, 2012).

2.1.2 Multiple Frames and Emotions

Existing literature has not explored the emotional responses that might arise from divergent frames. But emotions – internal, transitory, positive or negative responses to an object or event (Frijda, 1993; 2007) – can arise from social interactions, and can have profound effects on individuals' perceptions. Emotions generate cognitive appraisal, whereby individuals attempt to interpret the connections between their feelings and external stimuli (Weiner, 1986; Loewenstein and Lerner, 2003). Transitory emotions shape an individual's stable attitudes towards a stimulus: an individual's answers to questions of, "What do I think about him/her/it/them?" depend partially on the emotional states the subject evokes (Weiner, 1986; Loewenstein and Lerner, 2003). An individual experiencing a negative emotion de-values objects, situations, or individuals he or she believes caused it; an individual

experiencing a positive emotion develops favorable attitudes towards objects, situations, or individuals he or she believes caused it (Weiner, 1986; Loewenstein and Lerner, 2003).

Because emotions – and especially negative emotions – affect individuals' attitudes and behaviors, they can shape organizational outcomes. For instance, individuals working on a joint task develop emotional responses to success or failure (Lawler, 2001). Those experiencing negative emotions attribute their emotions to others working on the task; these attributions lead to important social outcomes, including lowered cohesion and solidarity, and affect future performance (Lawler, 2001). Decisions around sensitive issues such as the unsatisfactory performance of an organizational member can evoke anxiety, fearfulness, and negative emotional cycles that result in a pervasive climate of mistrust and a lack of safety (Maitlis and Ozcelik, 2004) that, in turn, influences learning and thus performance (Edmondson, 1999). Organizational changes that give rise to identity threats can result in negative emotional responses that reverberate throughout an organization; these emotions can have a profound impact on the success or failure of strategic change initiatives (Huy, 1999; 2002; 2011; Sanchez-Burks and Huy, 2009). Research on alliances has hinted at the potentially destructive impact of negative emotions; Doz's (1996) classic process study, for instance, named partners' increasing frustration as having a negative impact on the alliance.

Despite the importance of emotions for individual perceptions and organizational outcomes, existing research has not explored the connection between frames and emotions in nascent industries. Yet frames are inextricably tied to processes that elicit strong emotions (Barsade and Gibson, 2007; Huy, 2012): understanding change, interpreting identity, making sense of highly contested decisions (Reger, Gustafson, Demarie, and Mullane, 1994; Kaplan, 2008; Tripsas, 2009). Yet as Vornov and Vince (2012) recently wrote, frames and framing have been "conceptualized in cognitive terms, with little attention to emotional resonance" (74); the possible emotional impact of divergent frames has been under-theorized.

The focus of this chapter is thus on uncovering the relationship between ambiguity, divergent frames, and emotions. This analysis suggests that the ambiguity inherent in a nascent industry can set the stage for divergent frames that lead to negative emotional and cognitive spirals. These spirals can preclude the possibility of successful integration or the development of shared frames, profoundly affecting innovation projects. Understanding and managing whether and how this occurs is critical in driving effective collaboration and innovation in projects characterized by high ambiguity, including those in nascent industries.

2.2 Method

The analysis developed here is grounded in a longitudinal, qualitative study of two innovation projects in the nascent smart cities industry, involving collaboration between hundreds of individuals from 19 organizations. The initial purpose of the study was to generate theory on the mechanisms and processes that encourage or stifle innovation in a nascent industry; the qualitative approach was therefore most appropriate (Edmondson and McManus, 2007). In pooling data from the two projects, I hoped to uncover mechanisms and processes that were applicable in and generalizable to multiple contexts (e.g. Bechky and Okhuysen, 2011). This approach differs from that of planned multiple case-studies (Eisenhardt, 1989a). My purpose was not to compare the outcomes of the two projects, but rather to see whether and how patterns and processes replicated across them. My focus on frames and emotions was not determined *a priori,* but rather emerged through their importance in the data (Glaser and Strauss, 1967).

I develop theory by analyzing strategic decisions in the two projects in multiple steps, both accounting for variance in the data, and unearthing the process of framing clashes. An analysis focused on variance attempts to propose relationships between independent and dependent variables (Mohr, 1982). By comparing strategic decision points in the data, I discovered that actors evaluated some early

strategic decisions by relying on divergent frames around a project's purpose. When this occurred, decision-making became problematic: decisions were deferred or hotly contested, and were described in highly emotional terms. In contrast, decisions that did not involve divergent frames were resolved, and were not described emotionally. An analysis focused on process explains the sequences of events that lead to an outcome (Langley, 1999). By analyzing problematic decisions, I identify the patterns and sequences that arise from decisions involving divergent frames. I develop a model of framing clashes that explains the connection between ambiguity, divergent frames, and emotions, and that reveals the importance of negative emotions in shaping relational and innovation consequences. My aim is to propose rather than test theory; the model developed here is tentative, and further research is needed to test and refine my claims.

2.2.1 Research Setting: The Smart Cities Industry

Over a period of three years (late 2009 – late 2012), I studied the development of SusTech City and GreenMarket (pseudonyms), two ambitious innovation projects in the nascent smart cities industry. The industry began to take shape in the latter half of the first decade of the 21st century, as several companies and governments announced efforts to make new and existing cities more intelligent: technologically-connected, low-carbon, and sustainable. These companies and governments planned to develop and deploy internet and information technology (IT) to improve the operational efficiency, environmental sustainability, and quality of life in the world's cities. To learn more about this context, I gathered primary and secondary data on smart city initiatives. I conducted over a dozen interviews with relevant players and observers, including architects and engineers, leaders of several technology companies, and governmental officials working on smart city projects around the world. I gathered reports on smart cities from companies and think-tanks including McKinsey Consulting, IBM, Cisco, HP, Oracle, and Forrester.

SusTech City and GreenMarket were identified by industry observers as pioneers in the smart city industry. As Table 2.1 indicates, although the projects studied varied widely in their aims and their duration, each involved multiple individuals from different professions and industries who hoped to come together to share information, coordinate their work, and engage in joint problem-solving to develop a smart urban development. My research at SusTech was concurrent with the project's launch; in contrast, when I began research, GreenMarket was in its later stages of development. Nonetheless, the process I captured generalized across both cases.

Table 2.1: Overview of Projects

	SusTech City	**GreenMarket**
Aim	Smart, sustainable city	Smart, low-carbon district
Projected time-scale	15+ years	3-5 years
Number of organizations involved	11	8
Types of organizations involved	Technology (software) Technology (hardware) Real-estate development Engineering Architecture Consulting Government	Innovation fund Construction Real-estate development Engineering Architecture Consulting Government Consumer behavior
Leading organization	SusTech: technology	Telavera: innovation fund
Start of project	2009	2008
Start of research	2009	2011
End of research	2012	2012

SusTech City

I studied the development of SusTech City over the course of three years. SusTech City was initiated by SusTech, a technology start-up hoping to develop and deploy technological solutions that made urban spaces more connected, efficient, and sustainable. As part of their business plan, SusTech leaders sought to develop a 'smart' community of 250,000 residents in a greenfield site. To do so, they worked with individuals and organizations from across industries, including members of the local government, a real-estate development firm, a global consulting firm, an engineering firm, an architecture firm, and several technology firms. These individuals hoped to plan and construct the city in a series of phases, starting with a smaller residential community and technology cluster. When I began research at SusTech City, the project was still in its earliest stages: the individuals working on it were trying to acquire land, develop a conceptual master-plan, and develop technologies to embed in the city.

GreenMarket

I studied the development of GreenMarket over the course of 18 months. GreenMarket was initiated by the leaders of Telavera, an investment fund focused on catalyzing innovation in its home country. The leaders of Telavera's Energy Department (engineers focused on sustainable energy solutions) and Design Team (architects, designers, and technologists) initially sought to plan and build one of the world's first smart, low-carbon districts in a former industrial area about the size of a large city block. They engaged two local real-estate development companies, a local construction company, and an international engineering firm, architecture firm, and consumer behavior research firm.

Individuals from the firms agreed to apply their capabilities and expertise – from engineering solutions to real-estate development capabilities – to jointly plan and deliver the block. When I began my research, they were finishing designs for the district and hoped to break ground within the year.

2.2.2 Data Sources

Interviews

My primary source of data was in-depth interviews with individuals working on the projects. Overall, I conducted 102 interviews with 59 individuals. These semi-structured interviews ranged from 60 minutes to 3 hours, and were tape-recorded and transcribed. I questioned participants on how they thought about each project, their work, the challenges they faced, and how they resolved them. I also questioned them on notable strategic decision points within each project: what they were, how and what decisions were made, why they were important, and how they impacted the project. Whenever possible, I interviewed the same individuals at different points in time. By interviewing the same participants over a prolonged period, I began to develop an integrated understanding of decision points, the progress of each project, and interviewees' evolving perspectives.

Observation

I visited each site multiple times, making six visits to SusTech City, and three to GreenMarket. During each visit, I spent a number days or weeks on-site, immersing myself in its culture. When on-site, I observed interactions and attended project meetings. I also sat in on several casual gatherings (including lunches and dinners), and conducted a number of informal interviews. I took extensive field notes during each visit, including detailed notes on what was said, descriptions of how individuals interacted, and ongoing personal reflections on unfolding events. My presence in the field allowed me to build the trust and familiarity necessary to investigate sensitive phenomena. I triangulated interview

data with field notes, including notes from 40 SusTech City meetings and numerous informal engagements, and two GreenMarket meetings, one full-day project session, and two informal dinners.

Document Review

I collected and analyzed archival documents from each site. At SusTech City, these documents included successive business plans and presentations, and master-plans for the City's development. I was also copied on a number of emails exchanged between the leadership team of multiple organizations: my data includes 105 emails. At GreenMarket, these documents included analyses and reports from multiple organizations involved in the project on its potential and performance. I also analyzed a project blog written in real-time by the leaders of Telavera. Together, I analyzed close to 340 pages of documents across the two projects. Table 2.2 summarizes these data sources.

Table 2.2: Chapter 2 Data Sources

Context	Data source	Quantity
Smart city industry	*Interviews* Architects, engineers, developers, government officials, CEOs	14 individuals and interviews ~20 recorded hours
	Observation Presentations of smart city projects, smart city symposia	~10 recorded hours
	Documents Articles, analyst reports	~200 pages of documents
SusTech City	*Interviews*	41 individuals 69 interviews ~120 recorded hours
	Observation 6 field visits: observation, employee shadowing, informal interviews	40 meetings 10 presentations ~800 hours in the field
	Documents Business plans Project reports Emails	~200 pages of documents ~44 pages of emails
GreenMarket	*Interviews*	18 individuals 33 interviews ~ 40 recorded hours
	Observation 3 field visits: observation, informal interviews	2 meetings 1 presentation ~100 hours in the field
	Documents Project reports Project blog	~50 pages of documents ~40 pages of blog

2.2.3 Data Analysis

I iterated between data collection, analysis, and literature review (Glaser and Strauss, 1967), and began by writing case studies about each project that attempted to capture its aims, its history, the people and organizations involved, and all notable decisions. This within-case analysis allowed me to gain familiarity with each project and formed the basis for subsequent analysis (Eisenhardt, 1989a). In constructing the case studies, I recognized that individuals in both projects brought different interpretations of the project's purpose. Using QSR NVivo, the qualitative data analysis software, I coded instances in the data where individuals referred to a project's goal, aim, purpose, mission, or objective. Comparing these instances, I recognized that three different interpretations were prevalent at SusTech City and GreenMarket. I also recognized that these interpretations depended on each individual's profession and industry background. Comparing the data with literature, I began to conceptualize these interpretations as *frames.*

As I brought the conceptual category of frames back to my analysis of the projects, I realized that frames were particularly salient to project participants during moments of strategic decision-making. Following this observation, in the next stage of analysis, I began to construct accounts of important strategic decision points within each project. For a decision point to qualify as 'strategic,' it had to allocate significant resources, set an important precedent, or have consequences for the project's success or positioning (Eisenhardt, 1989b; Eisenhardt and Zbaracki, 1992). To qualify as 'important,' it had to be referenced in multiple accounts across the data. 15 decision points met the criteria, and I wrote lengthy accounts of each. In these accounts, which ranged from five to 25 single-spaced pages, I

included multiple narratives about what happened (noting all individuals and organizations mentioned) and when it happened. In the context of each decision point, I also coded and wrote about each participant's preferences (what s/he wanted to occur and why), attributions (why the decision unfolded in the way it did), his or her perceived consequences (what followed as a result), and his or her emotional response (including, among others, neutrality, disappointment, frustration, and excitement). Table 2.3 provides an overview of decision points analyzed. I noted that, whereas five decision points were successfully resolved (that is, actors managed to reach consensus on a choice), ten were problematic. In five of these ten cases, decisions were deferred; in five other cases, although a choice was made, actors continued to disagree about it. Of the five decisions at SusTech City, one was resolved and four problematic; of the ten decisions at GreenMarket, four were resolved and six problematic.

Table 2.3: Strategic Decision Points at SusTech and GreenMarket

Strategic decision point	**Partners involved** (*pseudonyms*)	**Industry backgrounds**	**Evidence of Divergent Frames**	**Outcome**
SusTech City: financial projections Should we rely on models from technology industry?	SusTech; CC	Technology; real-estate; consulting	Strong	***Problematic**:* continued disagreement
SusTech City: phased development Should we prioritize the development of SusTech City, or the development of Wave 1 of SusTech City?	SusTech; RD; EngCo; ArchCo; Government	Technology; real-estate; engineering; architecture; government	Medium	***Problematic:*** decision deferred
SusTech City: new project Should we develop a smaller version of the project in another country?	SusTech; RD	Technology; real-estate	Weak	***Resolved:*** agree to pursue project
SusTech City: demonstration of technologies Should we invest in an at-scale demonstration of technologies for the City?	SusTech; RD	Technology; real-estate	Strong	***Problematic:*** decision deferred
SusTech City: master-plan Should we invest in a detailed master-plan for the City?	SusTech; RD	Technology; real-estate	Strong	***Problematic**:* decision deferred
GreenMarket: contract costs What should we demand of, and how much should we pay our design team?	Telavera; Pence; Casilla	Design; real-estate	Strong	***Problematic**:* continued disagreement
GreenMarket: certification Should we apply for external certification (e.g. LEED standards) for sustainability?	Telavera; SFG	Design; engineering	Weak	***Resolved:*** agree not to pursue certification
GreenMarket: mixed-use Should we develop a residential-only or a mixed-use project?	Telavera; Pence; Casilla; SFG; Arkitektura; DesignCo	Design; real-estate; engineering; architecture	Weak	***Resolved:*** agree to develop mixed-use project
GreenMarket: massing What should the building lay-out look like?	Telavera; Pence; Casilla; SFG; Arkitektura	Design; real-estate; engineering; architecture	Strong	***Problematic:*** decision deferred
GreenMarket: indoor air quality What kind of standards should we use?	Telavera	Design; engineering	Strong	***Problematic**:* continued disagreement
GreenMarket: common sauna Should we build individual or common saunas?	Telavera; Pence; Casilla;	Design; real-estate;	Weak	***Resolved:*** agree to

	SFG; Arkitektura; DesignCo	engineering; architecture		develop common sauna
GreenMarket: solar energy Should we generate energy from solar (PV technologies)?	Telavera; Pence; Casilla; SFG; Arkitektura; DesignCo	Design; real-estate; engineering; architecture	Strong	***Problematic**:* continued disagreement

Table 2.3 (Continued)

GreenMarket: construction materials Should we construct in timber?	Telavera; Pence; Casilla; SFG; Arkitektura; DesignCo	Design; real-estate; engineering; architecture	Strong	***Problematic**:* continued disagreement
GreenMarket: management company Should we invest in a shared management company?	Telavera; Pence; Casilla	Design; real-estate	Weak	***Resolved:*** agree to invest
GreenMarket: pro-forma Should we share financial figures of organizations working on the project?	Telavera; Pence; Casilla	Design; real-estate	Strong	***Problematic:*** decision deferred

In the third stage of analysis, I brought together my frame analysis with my set of strategic decisions to look for patterned variation in decision-making across projects. My focus in this stage turned to generating propositions about variance within the data. In particular, I attempted to account for differences that could explain why some decisions were resolved whereas others were problematic. Because SusTech City was in early stages of development, most important strategic decisions were about its business model and future performance. Because GreenMarket was further along in its development, most strategic decisions revolved around specific design choices. Nonetheless, I recognized certain patters replicated across both projects. Specifically, analysis of strategic decision points, summarized in Table 2.4, revealed that both resolved and problematic ones involved important choices and individuals from multiple industries, who were not always co-located at the time of the decision. Most were mediated by boundary-spanners who attempted to integrate multiple points of view. Many involved boundary objects – blueprints, project reports, physical models – that helped integrate diverse knowledge. Some, but not all, had stringent deadlines. Many involved political activities by the proponents of a particular choice, who prepared studies and materials and held private meetings intended to convince others of their point of view.

Table 2.4: Comparison of Resolved and Problematic Decisions

	Partners involved (average number)	**Industries (average number)**	**Co-located at time of decision (% yes)**	**Boundary spanners (% yes)**	**Boundary objects (% yes)**	**Presence of deadline (% yes)**	**Political activities (% yes)**	**Strong presence of divergent frames (% yes)**
Resolved	3.8	2.8	80%	100%	40%	40%	60%	**0%**

Problematic	3.5	2.9	60%	100%	60%	60%	60%	**90%**

As Table 2.4 indicates, one pattern emerged: problematic decisions were where each actor's preferences appeared to be shaped by his or her divergent interpretations of the project's purpose. Decision points that did not make divergent frames salient, on the other hand, were successfully resolved. In these decision points, actors' frames aligned; if they did not, actors did not explain their preferences with reference to their interpretation of the project's purpose.

In the next stage of analysis, I began analyzing the ten decision points marked by divergent frames to construct a parsimonious process theory that could capture prototypical patterns. This analysis involved looking across the cases of decisions that involved divergent frames to identify common sequences of action, cognition, and emotion. By stacking all decisions along two time-lines, illustrated in Figure 2.1, I recognized that divergent frames were often prevalent in early decisions, and that problematic decisions increased in frequency over time. Moreover, these decisions were usually described in emotional terms. Specifically, actors expressed frustration (a feeling of being annoyed or upset), disappointment (a feeling of dissatisfaction) and contempt (a feeling of scorn and disdain). I focused my analysis on understanding more about these emotional responses, and their antecedents and consequences. In so doing, I began to construct a process theory that could capture the patterns and sequences that occurred during and that followed the decisions. I required that an emotional, cognitive, or behavioral manifestation be present in multiple cases to be included in the process.

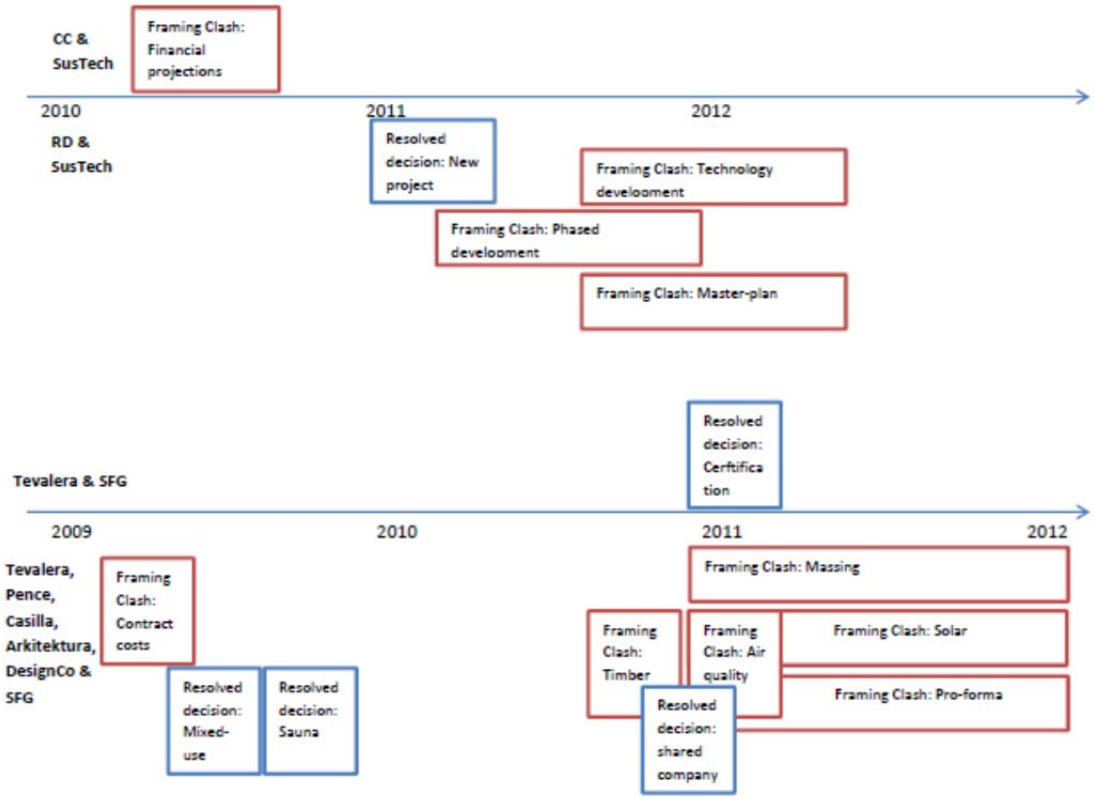

Figure 2.1: Decision Time-Lines at SusTech City and GreenMarket

As categories and concepts became more complete, I began to consider the literature on innovation, ambiguity, frames, and the impact of emotions. Comparison of the literature and my data led me to recognize that the process I had uncovered had not been theorized in prior work. It was in this stage that I began to conceptualize the process as one of *framing clashes*. I terminated data collection and analysis once my account captured the variation across and the patterns within my data; that is, when I felt I had reached theoretical saturation.

2.3 Ambiguity, Framing Clashes, and Negative Emotions

When SusTech City and GreenMarket were launched, the smart city industry was in its nascent stages. Although a number of smart city projects were announced around the world, they had not yet been developed. Project leaders and industry observers thus noted a lack of consensus on precisely what the term *smart city* meant. Announced projects varied widely in size: some were envisioned as new neighborhoods like GreenMarket, others as retrofits of existing cities, and others as entirely new cities like SusTech City. Emphasis on technology – the *smart* component – varied across projects: some intended to use existing technologies to make individual buildings more efficient; others intended to develop new technological solutions to connect entire projects. Emphasis on real-estate viability – the *city* component – also differed: some projects were envisioned as practical urban spaces where people would live and work; others were envisioned as demonstration projects whose primary purpose was the testing of new technologies. A smart city report stated that smart city projects "are quite diverse in their approaches and objectives…. Smart city is an umbrella concept for a variety of systems in a city." An engineer from a global company who had worked on a number of smart city projects explained how these initiatives varied widely, and how there was no stable understanding of what a smart city was:

> The innovation ten years ago was around green buildings and things like dimmable lights. Now we have moved to talking about smart or zero-carbon cities. But nobody really knows what that means. These projects are all highly aspirational, but they are so different from each other…. Some are private, some are public initiatives…. Some are new cities, some are large suburban

> developments trying to masquerade as eco or smart cities…. The people who are leading these projects have never done anything like this before. And there is no real research on what a smart city is, or how cities should be developed.

The individuals developing SusTech City and GreenMarket thus faced ambiguity around what a smart city or smart, low-carbon district meant. "We're working on something that doesn't yet exist," a governmental leader working on SusTech City explained; "We will be the first smart city." A SusTech employee explained how even the word *city* failed to capture the novel nature of the project: "We might even want to change the word city. What we are building is something completely different." Similarly, a Telavera technologist explained: "We are building the first genuinely 21st century block." Individuals working on the project thus lacked shared templates or proven models for precisely how a smart city or a smart, low-carbon district should look, how it should perform, and what developing it entailed. "There is no template for building new cities," a SusTech executive reflected during a meeting. Similarly, an architect working on GreenMarket reflected: "There is no precedent for this kind of project. There is no model that exists for it." "When we launched the project," a designer working on the project recalled, "We didn't know what we were doing…. There is no template or precedent."

2.3.1 Ambiguity Gives Rise to Divergent Frames about Project Purpose

In the absence of stable categories, individuals from different professions and industries brought different frames about smart cities. These frames included different interpretations of the problems facing the world's cities; of what a smart city was – and hence what SusTech City or GreenMarket should aim to be; of the role of technology in each project; and of what constituted innovation. Three predominant frames were present.

Individuals with experience in the technology or software industry brought a *technology* frame. They believed that the problem of the world's cities was their lack of technological advancement. They understood the smart cities industry in general, and SusTech City and GreenMarket in particular, as an

attempt to test and validate new technologies that could make cities smarter and more sustainable. For instance, "SusTech City is a means to an end," John, SusTech's CEO and a technologist, explained in an interview, "and that end is the demonstration and distribution of technology." These individuals thus believed that the technological connectedness was an end in itself; they viewed innovation as the development of new smart city technologies. A technologist, for instance, described what excited him most about SusTech City: "To me, in terms of knowledge about technology, in terms of potential, SusTech City was way ahead of anything else."

Individuals with experience in more traditional real-estate development and project management brought a *real-estate* frame. They believed the problem of the world's cities was their lack of livability. They understood the smart cities industry in general, and SusTech City and GreenMarket in particular, as an attempt to build more viable, livable cities. A member of RD, the real-estate company working on SusTech City, explained the project's purpose was, "To build some buildings." Similarly, the goal of the project, a Pence leader working on GreenMarket described:

> Is, of course, the block…. We hope the project will differentiate itself the marketplace…. Quite a few have green logos and that's it. Hopefully this will be different…. But of course, we don't want to lose money…. Governmental organizations sometimes just spend money to create something new….Maybe it's not the most profitable project in history – it doesn't have to be – but we don't want to lose money.

These individuals thus saw the purpose of technology as increasing a project's livability and salability; they viewed innovation as the development of new, high-technology solutions that would appeal to buyers and consumers.

Finally, individuals with prior experience in sustainable urban development brought a *sustainability* frame. They believed the problem of the world's cities was their lack of sustainability. They interpreted smart the smart city industry in general, and SusTech City and GreenMarket in particular, as an attempt to test and demonstrate new, replicable low-carbon solutions that could catalyze sustainable urban development. Tim, the head of Telavera's Design Team, explained how the aim of GreenMarket

was, “To come up with a low-carbon solution. The idea is two-part. We want to explore, what does it mean to be low-carbon, and how can we transition current cities to this model.” They saw the purpose of technology as increasing a project’s sustainability; they viewed innovation as the development of replicable low-carbon building solutions. For instance, an engineer working on GreenMarket elaborated:

> If we just do this one project, we have failed. We need to be transforming the design process, the way different industries work together, the way buildings are designed and constructed and permitted…. [We are thinking about] how to make the design solutions applicable in many, many projects in the built environment….It’s not just a one-off …. Telavera is really thinking about transformation. That, to me, are the project’s most important, most challenging goals.

Table 2.5 provides additional evidence of these frames.

Table 2.5: Examples of Frames

	TECHNOLOGY	SUSTAINABILITY	REAL-ESTATE
Diagnostic: The problem	Cities are not *smart* The industry was so ineffective, inefficient, and needed to find ways of being much more effective…. **We don't use technology as much as we should do compared to other industries**. (SusTech City - technologist)	Cities are not *sustainable* We saw the biggest challenge globally is understanding what sustainable development actually is: how do you measure it, how do you implement it, how do you replicate it. We realized we were in no position to pull out ready-made solutions from a shelf…we **actually don't know how to define the problem quite yet**. (GreenMarket - designer)	Cities are not *livable* The challenge with new building but particularly with old buildings is about: How the hell do you bring life and **vitality, business, and the economic sustainability** back into some cities that are struggling? (GreenMarket - developer)
The solution: The project	SusTech City is a means to an end, and that end is the **demonstration** and **distribution** of **technology**. (SusTech City - technologist)	The project is an **alibi** to address a broad set of issues around **sustainable development**. (GreenMarket - designer)	We really hope the project will differentiate itself in the marketplace. It is hopefully an honest project – because **quite a few have green logos and that's it. Hopefully this will be a different kind of project.** (GreenMarket - developer)
Purpose of technology	Development of technology as an end in itself We started off from a shared vision of **networking a whole city** and applying technology to a city from the planning stages….This is at the **core of the vision**. (SusTech City - technologist)	Technology should make the project sustainable We are thinking about new technologies and how people can use them to **promote sustainability**. (GreenMarket – designer)	Technology should make the project sellable and livable The aim of the project…. Is to build some **buildings**. (SusTech City – developer)
Innovation	New technologies "I don't want to sit down with the master-plan. **I want to think about technology, innovation** – with the rest of it, I just turn off. **It really shows where the focus of the project is.**" (SusTech City – technologist)	Replicable sustainability solutions Q: What do you think is most novel about the project? Three things…. One, the emphasis in the design phase on the user is completely novel…. Two, timber…It really isn't done – and it will be pretty **transformational**… Three, **building-integrated PVs and low-light options that are at the brink of being commercially viable**. If there were to be uptake, we could put them over the edge and make them commercially viable. (GreenMarket – engineer)	New urban solutions Q: What do you think is the most novel thing about this project? It's a mixed-use project…. Our housing is connected to the retail mix, on the same block…. For me that's something new, and **something better for residents**. It's taking the synergy of different parts and bringing a higher service level to the block. (GreenMarket – developer)

2.3.2 Divergent Frames Give Rise to Framing Clashes

Actors' divergent frames shaped their perspectives on a number of early strategic decisions. Individuals with the *technology* frame thought about decisions by evaluating their impact on a project's technological development; those with the *real-estate* frame by evaluating their impact on livability, salability, and cost; those with the *sustainability* frame by evaluating their impact on sustainability and replicability. For instance, a Pence developer explained how she thought about decisions at GreenMarket: "The big question at the moment is if the decisions will be really, really costly. Then they won't serve us very well." In contrast, an engineer explained how she thought about decisions:

> All decisions are put through the 5 frame lens that focuses on sustainability… If you have no pre-determined way to make decisions on the project, you will come back to making decisions by first-cost and payback (which is a how every normal project is run – by thinking about "can we afford sustainability?"). We are actively thinking about how to make decisions differently, with a focus on sustainability and replicability, because we want to arrive at a different outcome.

When frames led to unaligned preferences, actors debated their options; although typically unacknowledged, these debates revolved around their divergent, clashing frames about each project's purpose. I thus conceptualize these decisions as *framing clashes.* Some framing clashes revolved around each project's business model: how it would be financed, how it would attract investment. For instance, an early clash at SusTech City revolved around developing a financial model for the City that could be presented to potential partners and investors. Other framing clashes revolved around development features that would affect a project's costs, performance, and the way it was positioned in the market place. For instance, one of the earliest clashes at GreenMarket revolved around the choice of construction materials for the block.

Decision-making around SusTech City's financial model involved divergent frames about the project's purpose. Individuals from SusTech with the *technology* frame believed that SusTech City would demonstrate the growth and time-lines typical of comparable technology projects (in line with their view of SusTech City as a technology project). John, SusTech's CEO, proposed a financial model and

explained how he arrived at SusTech City's financial projections: "These numbers are pretty standard in the technology industry." Individuals from CC with the *real-estate* frame believed SusTech City would follow a different pattern of growth: that typical of real-estate projects. "There is no real-estate project that can grow that quickly," a CC consultant working on the project reflected of John's proposed numbers.

These individuals engaged in heated debates about the financial model. "We've had a lot of arguments about the numbers," a SusTech executive explained. During a visit to SusTech City, I observed an argument between John, supported by SusTech executives, and members of CC. Members of CC had developed a financial model that they hoped to begin presenting to potential investors. Although they had previously received John's proposal, their model reflected their *real-estate* frame, and included numbers typical of real-estate projects. When John saw the model, he became visibly upset. He exclaimed:

> This model is a joke! This doesn't make sense in the technology industry, and this is not a consulting business!... You guys don't understand the numbers of tech at all. You're just going to have to believe me…. I'm not being disrespectful, but this is a property development plan.

A SusTech executive attempted to mediate and stated, "It's a tech plan with a bit of a shift…." John interrupted: "That's *not* a tech plan."

Eventually, the leaders of SusTech City chose to abandon CC's model, instead developing their financial projections by benchmarking patterns typical of technology projects, as John had initially proposed. But this decision remained controversial. Individuals with real-estate backgrounds continued to express doubts about the choice both in interviews, and by revisiting it in project discussions. "This choice is crazy," a CC consultant reflected. Another consultant explained: "We can't expect to get financing when presenting these numbers."

An early strategic decision point at GreenMarket – the choice of construction materials for buildings in the district – also made divergent frames salient. The lead engineer working on the project,

Sergio, suggested the use of timber. Individuals involved with the project quickly coalesced into a pro-timber and an anti-timber group. Individuals with the *sustainability* frame supported the use of timber, which they described as an under-utilized yet highly sustainable material. By developing the region's first timber block, they believed they could inspire the use of timber in other developments throughout the country. A report written by a Telavera designer praised the sustainable performance of timber, and noted that, by using it, "Hopefully…we will be able to convince the local construction industry that there is something to multistory timber frame construction." "Building with timber really isn't done here," an engineer explained. "It will be pretty transformational if we can work out how to do it." Individuals with the *real-estate* frame hesitated to commit to an unproven building material that carried a cost premium over traditional concrete construction, as indicated by project reports analyzing the use of timber. A Pence executive explained his thoughts on timber: "In this project, we don't have money just to try out different things for the sake of the environment."

Actors working on GreenMarket engaged in protracted discussions about whether to build with timber. Timber proponents – members of Telavera, and the engineering, architecture, and consumer behavior firm – argued for its adoption, while timber opponents resisted. An engineer explained: "We tried to show them…timber is just a far more sustainable approach. They were almost dismissive of the analysis, and we had to keep coming back to them and saying, let's talk through this." Eventually, forced to choose a construction material in order to move forward with the project, individuals at GreenMarket reached an apparent compromise: Telavera's new office building, part of the district, would be constructed with timber, and all other buildings would be constructed with concrete. A consumer behavior expert explained the outcome of the decision: "Telavera was very open to the idea, and pushed towards it. But Pence and Casilla weren't interested. Those were the battle-lines in the end." But this decision remained problematic: pro-timber actors continued to disagree with it, and described it as having negative effects for the project. An architect explained the timber decision: "The project doesn't

achieve at the level we were all aiming at…. There are technical aspects that are not as innovative as they could have been. That's the pity…. And it has been quite a fight."

2.3.3 Framing Clashes Give Rise to Negative Emotions

These early framing clashes gave rise to strong negative emotions. When frames clashed, the process of decision-making evoked frustration, or strong feelings of irritation or distress (van Dijk, 1999). Debates and protracted discussions around the decision were seen as a waste of time; moreover, participants reflected that discussions were only necessary because others did not or could not understand the project's aim and potential. In cases when a framing clash resulted in a choice, these choices gave rise to disappointment and contempt, because undesirable choices threatened actors' frames and even their roles in the project.

Actors involved in the clash around SusTech City's financial model, for instance, displayed visible emotional responses during their arguments, and described their decision-making in highly emotional language. A SusTech executive explained how the discussion around SusTech City's model was a result of CC members' lack of understanding: "The CC guys just don't understand and believe what we are trying to do. That's why we've had the argument about numbers." This discussion thus drove frustration, sometimes explicitly identified, sometimes audible in conversations and interviews. During the aforementioned argument about numbers that took place over the course of an hour, John appeared angry and irritated; CC consultants defensive and frustrated. Following the argument, John angrily left the room to smoke a cigarette outside. Passing me on his way out of the door, he commented that the argument frustrated him because it "represents a misunderstanding of the project by some people."

When asked a general question about challenges he faced working on the project in an interview the following week, John immediately brought up the argument. He emphasized that he

experienced frustration at having to explain the appropriate course of action around SusTech City's financial model to CC members. "CC struggles a bit. They'll sometimes come at a problem with either no context or they'll make independent decisions on certain things that are strategically poor. That drives me crazy." In talking about CC and the argument, he became audibly upset: his voice raised; his speaking pace quickened. "I'm really not here for their personal development!," he exclaimed.

CC executives described the argument in equally emotional terms. In the weeks following the argument, they continued to reflect on it amongst each other. In discussing it, they often mentioned their frustration and disappointment with SusTech; their tone was often one of incredulity. Reflecting on the biggest challenges he faced in the project in an interview, a CC consultant explained how the clash was one of the most frustrating experiences of the project. "We had been working on this model for weeks and weeks on end," he recalled. "And John basically completely flipped when he looked through the numbers…. It was really heated."

Actors involved in GreenMarket's decision of construction materials explained the decision in equally emotional terms. Pro-timber actors felt frustrated by the need to convince others of their points of view. "We pushed for timber on a variety of levels," a pro-timber consumer behavior specialist explained. "We met with regulators and suppliers, and tested the ideas with residents and future owners." He sighed and lowered his gaze: "In the end *[sigh]*, they didn't accept it."

An engineer described how the process of arguing for timber was a frustrating one: "We had to just keep coming back to it and keep coming back to it, and Sergio just had to be a complete pain in the ass." This frustration was deepened by a sense that others did understand how timber advanced the project's aim. Asked to reflect on project challenges, a pro-timber architect began explaining the timber decision. His frustration was apparent throughout the interview; in a field note jotted immediately following the interview, I emphasized that "he was filled with frustrations he seemed eager to share." As

we spoke, he grew increasingly heated. “What I am telling you is not politically correct!,” he exclaimed. But he went on, with audible annoyance:

> Pence Development and Casilla expressed two fears with regards to timber…and they were unsound…. I think their excuses were just a camouflage for the real reason, which is a skepticism and ignorance of the medium. They claim the timber construction would not have been taken well by the market… I think it’s just a camouflage for the fear of getting involved in technical construction that is unknown to them… It has been really frustrating. We sense, also, the frustration Telavera has had with the whole process.

Pro-timber actors also expressed deep disappointment due to the choice to develop the block partially in concrete. The decision was described as a deeply-felt loss: rather than a choice between materials, the decision was seen as representing a choice about the purpose of the project. Pro-timber actors felt that they failed to effectively deliver on their tasks, because they could not convince others about the potential for the project as a catalyst. An architect explained:

> Pence and Casilla reverted to business as usual in many cases, and that was a problem. And the fact that our design team didn’t manage to sell their part convincingly was also at fault... On the one hand, we were a bit misguided and misled about what they would want. We thought they would want 100%, and they just wanted 30%.... In the end, we lacked the punch. Obviously we were not in position of dealing the last punch for them to make the right decision.

A pro-timber Telavera designer described with audible disappointment how the outcome of the timber decision was the result of Pence and Casilla’s misunderstanding of the project’s purpose:

> We had a bunch of different decisions that we had to make…that required Pence Development and Casilla to think a little bit differently than their normal practice is, especially around timber construction rather than concrete. And unfortunately the people that were at the table at that time…didn’t have the view to see the long-term or strategic impact these decisions could have.

“What we have seen,” he explained with audible disappointment, *“[sighs]* is a complete erosion of ambition.”

In contrast, contested decisions that did not involve divergent frames did not lead to negative emotions. For instance, individuals working on GreenMarket had to decide whether they should apply for LEED (Leadership in Energy and Environmental Design) certification, an internationally-recognized

certification system focused on a development's sustainability performance. The engineers working on GreenMarket believed that applying for LEED certification would help position the project in the marketplace. An engineer explained: "Usually, the projects that we work on demonstrate success through external certification. It is something that people can understand. If we're not doing certification, it is more difficult for us to communicate what we are actually doing and how we are different." In contrast, Telavera designers believed that certification standards would not capture the "unique" goals of the project, and therefore opposed certification.

As a result, this decision was debated. An engineer working on GreenMarket explained that, "There's been a lot of debate about certification. This drama is still being played out. It's been flip-flopped back-and-forth…. The jury is still out."

However, this decision did not evoke divergent frames: both the engineers and the designers' preferences were driven by their *sustainability* frame. On the one hand, an engineering report stated that: "We recommend certification because… replicability is a central tenet of the project framework, which cannot be achieved without awareness." On the other hand, designers believed that certification "did not have the larger goals of sustainable development or replicability in mind." As a result, the decision was resolved – leaders decided to pursue certification – and discussions did not appear to evoke any negative emotions.

2.3.4 Negative Emotions Lead to Problematic Decisions

Negative emotions led to problematic decisions. When possible, frustrated individuals deferred decisions; when choices were made, disappointed and contemptuous individuals continued to disagree with and contest the decision. For instance, RD developers and SusTech technology experts faced an early decision around whether or not to develop a detailed master-plan for the project. This decision

made divergent frames salient: RD members with the *real-estate* frame believed investors would want to see a complete master-plan, as they did for typical developments; SusTech members with the *technology* frame disagreed, because they believed the development's technological solutions would form the basis for securing investment. An RD developer explained, "This is where us, as RD, versus some of the SusTech team, have a difference of opinion. We feel that we need to move to the next stage of the project and develop a more detailed master-plan that will allow financing to come forward." RD developers repeatedly expressed their views to SusTech's technology experts, but felt like the technologists did not take these views into account. Frustrated by the on-going process, RD developers stopped insisting on a master-plan, and the decision was deferred; ignoring the decision was seen as easier than continuing the frustrating process of convincing SusTech members of their point of view. "The frustration for me," another developer explained, "is that [SusTech City] could be so good." But, he went on, "there have been these hiccups with moving forward" that made deferral an attractive option.

When actors were forced to choose a path forward despite their divergent frames, their disappointment and contempt led to continued disagreement around decisions. Because these decisions evoked such strong disappointment and contempt, individuals were unable to accept them as necessary or even adequate solutions. At GreenMarket, pro-timber actors, for instance, continued to disagree about the outcome of the timber decision. In interviews, they fixated on the decision as having a profoundly negative outcome for the project. "It was an enormous missed opportunity," an architect explained.

2.3.5 Negative Emotions Lead to Cognitive Narrowing

The negative emotions that resulted from framing clashes set the stage for project outcomes beyond each strategic decision point. Although transitory, emotions can lead to the formation of long-lasting attitudes (Weiner, 1986; Loewenstein and Lerner, 2003). That is, individuals who experience an

emotion due to a particular entity begin to evaluate it with favor or disfavor: individuals like the objects and entities that evoke pleasant emotions; they fear or dislike those that evoke unpleasant ones. Emotions also result in narrowed attention (Loewenstein and Lerner, 2003): individuals focus on the positive qualities of entities that evoke pleasant emotions, and on the negative qualities of entities that evoke unpleasant ones. Frustration, disappointment, and contempt led individuals working on SusTech City and GreenMarket to develop unfavorable attitudes about others. Specifically, these negative emotions led to cognitive narrowing: individuals began believing that groups with different frames were fundamentally different from each other (an ossification of differences); they developed unfavorable attitudes about others' experience and ability to understand and pursue the project (judgments of competence). Importantly, individuals did not simply recognize that others held different visions of or frames about a project's purpose; instead, their negative emotions led to a generalized sense that others were both inherently different and even incompetent.

Following their arguments on the financial model, for instance, individuals from both SusTech and CC emphasized the differences between the two groups, and made derogatory comments about the expertise and knowledge levels of the others. John explained that CC members held inappropriate preferences because:

> They lack commercial experience. They don't have enough operational experience, and they are often theoretical…. If the business model that we had was more generally shared in the industry – if it was something that was more common – they would have it down like they do other models….It's new, it's got lots of moving parts to it….It's a fast-moving project with fast-moving situations so it's tough for them to understand.

Similarly, reflecting on the discussions regarding SusTech City's master-plan, two RD developers explained how SusTech technology experts were fundamentally different and naïve about the project's requirements:

> Developer 1: With the greatest respect to these guys, we're dealing with IT-based people, which is a very different world. At the end of the day, in the IT world, all they've got to do to make

> their good idea marketable, normally, is rent some service space, and that's pretty cheap. What these guys would like to do is go and build some buildings, and that ain't cheap.
> Developer 2: I used the word "denial" earlier, and I think I'll repeat it. I think they think that their ideas and systems are so fantastic that everything else will fall in line. But, it won't.

At GreenMarket, actors involved in the timber clash also began to emphasize that individuals with different frames were both fundamentally different and of questionable competence. A Telavera designer explained how individuals from Pence and Casilla were simply different: "The fundamental challenge that we had was cultural: our disposition, our mental references were different. We realized quite late with our partners we were saying the same words but meaning different things." A Telavera engineer pointed out insurmountable differences between groups, and questioned Pence and Casilla members' competence and understanding of the project:

> This has been and will be quite challenging because there are teams from different cultures and different countries. Telavera is an innovation organization and we are keen to develop new things and demonstrate them. Then we have partners that are in a totally different business like construction companies which seem to be quite hesitant to test new things and invest in development…. I must say that our partners in construction business have certain ways of doing things and they believe these are the right ways. So accepting new things has been a challenge.

Similarly, a Casilla executive explained how Telavera members did not understand the true nature of the project because "of course, Telavera is not a professional developer. We and Pence are professional developers. So in Telavera, they were expecting it would be so easy. Well, it's not. It took lots and lots of work." Moreover, she described how Telavera designers and the project's engineers and architects were not capable of delivering an innovative project:

> It was really hard to imagine what they understood from our local perspective and what they didn't. There were many things we took for granted – that these things we don't have to explain. Basic, basic, basic. Then it turned out they didn't understand them.

Table 2.6 provides additional examples of negative emotions and cognitive narrowing in the two projects.

Table 2.6: Examples of Emotions and Cognitive Narrowing

	SusTech City	**GreenMarket**
Emotions: frustration	"Obviously, it's **frustrating** that we haven't been able to achieve what we've wanted to achieve." (interview, developer; master-plan decision)	[Arkitektura architect contacted by Pence developer about making a change in massing of building. He tells Telavera designer about it]. Architect: "I'm really upset about that." Designer: "I don't know why he's approaching you – we've locked in the design in that regard. To make that kind of a sudden change doesn't make sense." Architect: "It's just very irritating, trying to get everything to work and then you get such an email." Designer: "It's beyond me – I'm as **frustrated** as you are." (field notes; massing decision)
Emotions: disappointment and contempt	"**I am really disappointed** I keep having to waste my time on this." (field notes, technologist; financial model decision)	"I **am very not pleased**. Because I think that was one of the great innovations in the project – how do you enable new patterns of consumption and behavior that are more aligned to sustainable things. Sometimes a purely market approach, unfortunately, doesn't work." (interview, designer; timber decision)
Cognitive narrowing: ossification of differences	"We are a small company, and that's what's hard. **We are very open – and [the engineers] are not**…. They were adding very regular concepts to SusTech City. **They are delivering their products rather than thinking outside the box**." (interview, architect; wave 1 decision)	"It's very good to talk about these things, and think about these things, but when you have solutions brought up by these **international** consultants who **don't know our situation here** – it just doesn't work." (interview, developer)
Cognitive narrowing: judgments of competence	"John is great and makes us laugh, and if he were here now I'd laugh with him. But he sends us little clips—"Look, they built this hotel in China in six days." All right. Okay. But what they've had is 18 months of planning offset in order to get there. And guess what? Lots of hotels fall down as well." (interview, developer)	"I think it's just a camouflage for the real reason, which is that Pence and Castilla **have a fear of getting involved in technical construction that is unknown to them**, with a certain amount of risk." (interview, architect)

2.3.6 Negative Emotions and Cognitive Narrowing Lead to Damaging Spirals

Early framing clashes thus had a long-lasting effect on collaboration and innovation in each project; they resulted in self-sealing spirals of increasingly negative emotions and attitudes. As Figure 2.1 indicates, instances of framing clashes escalated over time. Individuals who experienced negative emotions due to early framing clashes began to focus on information that confirmed their narrow view of others. This narrowing gave rise to further framing clashes, and cycles of even more profoundly negative emotions and, in turn, more extreme cognitive narrowing.

Escalating Clashes

For instance, a later strategic decision point at GreenMarket revolved around whether the development should produce its own solar energy through the deployment of photo-voltaic (PV), or solar, technologies. Solar energy production was not well-developed in the region where GreenMarket was located because of its specific weather conditions. Actors with the *sustainability* frame saw the project as an opportunity to develop new, low-light solar technologies that could be replicated in other developments in the region. An engineer explained:

> What I think is most novel about the project is the potential for developing building-integrated PVs and low-light options that are at the brink of being commercially viable. We could develop solutions that really work appropriately for this place… and we could ensure that other projects are able to use them.

Actors with the *real-estate* frame worried that solar solutions were inappropriate for the local market. As with timber, they hesitated to deploy untested, costly technologies. “To do a project like this, you just have to know the local conditions,” a Casilla executive explained, and solar solutions did not seem feasible locally. ““Oh, it’s possible in in other countries” – that just doesn’t help here…. Plus, these things are really, really expensive.” Actors engaged in a number of discussions about the feasibility of

solar solutions. “We have had discussions about this issue and that issue,” a Pence developer explained: “should we have PVs on the roof, how many PVs, who should own them…. It’s all being discussed.”

Convinced by their earlier framing clashes that others were fundamentally different and incompetent, the individuals involved in these discussions became entrenched in their points of view, and emphasized the differences that separated them. This narrowing led to an even more profound framing clash, even deeper negative emotions, and even more cognitive narrowing. “Progress has been hard-fought,” a Telavera report about the solar decision stated, “because, as we get ever closer to a real set of buildings, with real dimensions, real systems and real costs, we become more distant philosophically.” A Pence executive reflected that the discussions round solar were “challenging… We have different opinions and it is difficult. We’ve had to discuss everything,” because “Telavera members are too idealistic. It is frustrating for all of us.”

Eventually, actors involved in the solar discussions agreed to deploy solar technologies. Individuals from Pence and Casilla reflected that they accepted the solar decision because they sensed that pro-solar actors would not back down from their point of view, and because they sought to make progress on the project. “It seems like solar is really important for Telavera,” a Casilla executive explained; “We just had to decide,” a Pence executive echoed. But anti-solar actors experienced contempt due to this choice. Because they saw solar solutions as fundamentally detracting from the project’s viability as a cost-effective block – and because they perceived the choice as threatening their own role in the project – anti-solar actors reflected on the decision negatively. “We will have solar,” a Casilla executive explained, because of Telavera:

> But for us – our task is to take care that the housing is affordable. So putting these outrageously expensive things just for the show of it is a little bit – [sarcastically] *yeah*…. From our part, it’s not really the right message.

The Casilla executive's contempt for Telavera members who she believed imposed the decision was apparent: "Telavera wants to have a show, but we're realistic. Yes, of course we want to be more energy efficient. But we want to put resources to the places where they will bring about benefit."

An Atmosphere of Mistrust

As framing clashes accrued, these spirals of negative emotions and narrowed attitudes led to a pervasive atmosphere of mistrust. At SusTech City, RD developers began to feel incapable of affecting the project. "This is going to sound really demeaning to SusTech," a developer stated, but the company has no experience in "the property development industry. We do…. But they think their systems are so great that everything will just fall in line." In informal interviews, CC consultants frequently remarked on the frustration and disappointment they felt through working with SusTech technologists. A CC consultant remarked that working on the project was "frustrating" because John and SusTech technologists "drew too much on models from the technology industry" and did not understand the difficulties of building a city. SusTech technologists, on the other hand, expressed their belief that RD developers and CC consultants were too focused on traditional models from real-estate, and did not understand how innovative the City would be. "The RD engagement has been humorous at best," John stated in a conversation with other SusTech employees.

At GreenMarket, narrowed attitudes led to the development of what a Telavera designer described as "an "us and them" culture." Mistrust and seemingly insurmountable differences colored actors' perspectives even in cases where everyone agreed on a course of action. In the late stages of GreenMarket's development, for instance, executives from Pence put forward the idea that the district's outdoor balconies should be developed as indoor greenhouses, and brought this idea to individuals involved with the solar and timber decisions. In the early stages of the project, Telavera leaders' first idea, Tim recalled, "Was to have individual greenhouses." Pence leaders initially rejected this idea in

favor of outdoor balconies, but eventually changed their minds. Although the change was in line with his original preferences, frustrated and disappointed by previous decisions, Tim attributed it to Pence developers' inability to understand the project. He described how Pence members only cared about generating profit from the project:

> [The greenhouses] are nice from a gardening, food production perspective, if they actually get used for that. But… we haven't really figured out why they [Pence Development leaders] want this. My theory is they can sell apartments with greater number of square meters…. Somebody could just knock the greenhouse partition off and they could have a bigger apartment…. It's a way for them to maximize the developed floor, and their profit.

When asked if Pence leaders gave their reasoning for the revision, Tim responded that the Pence project manager "said, "well, this would be very in-line with our ecological approach."" Nonetheless, he held onto a narrow view of his interests: the initial idea "was discarded because it was an extra cost, so Pence was against it, until probably they realized that they could flip it around and actually make this a kind of sales asset." Tim's cognitive narrowing thus led to an unfavorable interpretation of Pence and Casilla's choices – even when those choices aligned with his own preferences.

These spirals also led to mistrust about prior decisions where everyone had agreed. One of the early innovations all individuals working on GreenMarket emphasized was that project executives had managed to convince the leaders of V-Energy, a local energy producer, to provide a clean-energy product for the development. Prior to their framing clashes, this outcome was viewed as innovative and important. Following the clashes, different actors attributed the innovation to their own efforts, and emphasized that others with a different frame could not understand it. Individuals with the *sustainability* frame noted that the product would eventually be made available in the producer's entire region, catalyzing the uptake of low-carbon solutions. A Telavera designer therefore explained that the innovation was a result of Telavera's focus on catalyzing change. Asked whether Pence and Casilla members had a point of view on the issue, he replied:

> Probably, but it wasn't evident to me…. In my conversations with them, they agreed it was an important decision, but I don't know what their position on it was. A lot of these kinds of decisions…they left to us. Even though they could make the decision and do the engineering also…that's not part of their business. They just deliver buildings…..But it was self-evident to us because our mission is systemic change. If your mission is to deliver housing, that kind of thing won't be self-evident.

Individuals with the *real-estate* frame emphasized that this decision drew on an established solution that could be used for the benefit of the block. A Casilla executive therefore attributed this step to Casilla's understanding of the local market and push for proven solutions:

> [The idea] was not on the short-list when we were doing the energy strategy – not on Telavera's short list. We called V-Energy…. It was really difficult for [Telavera and other partners] to get [that we could do this]. To me, it seemed that they were suspicious – it can't be true! ...It's too simple I guess.

Withdrawal

As excitement about each project gave way to negative emotions, ossification of differences, and judgments of competence, actors even began to question the viability of the projects. Importantly, individuals involved in framing clashes became de-motivated to move forward with the project. An RD developer explained how he became de-motivated from working on SusTech City: "It has been stop-start. So I am focusing on my day job." A developer from Casilla explained the progression of her thinking on GreenMarket:

> Developer: Initially, the scope was…phew…we want it all... We basically wanted to change the world and the country.
> Researcher: And what's your goal now?
> Developer: [*Laughs*]. Just get it done.

As a result, in a number of instances, individuals began to limit their interactions and even withdraw from the project. In GreenMarket, members of Pence and Casilla began asking for the design team to leave the project. Tim explained: "Things had gotten so extreme that Pence just started proposing, why don't we just get rid of the architects, engineers, and consumer design specialists." In

the case of SusTech City, individuals experiencing frequent clashes (including members of CC and RD) left the project entirely.

2.3.7 A Cognitive Perspective?

An alternative perspective might suggest that framing clashes simply revealed cognitive differences in the ways that individuals thought about each project. Once these differences were revealed, individuals began to believe (perhaps correctly) that they could not collaborate on the project, and decided to withdraw from it. Negative emotions were perhaps simply a by-product of this process, rather than a critical driver of relational and innovation outcomes.

The data, however, are not consistent with a purely cognitive story. If early framing clashes simply revealed differences (and if negative emotions were nothing more than a by-product), actors could have used tools and processes to help overcome differences and build shared frames in future decisions. Indeed, individuals working on SusTech City and GreenMarket did attempt to leverage tools and practices – boundary-spanners, political and framing practices aimed at changing the way others thought, co-location – to resolve differences. But because their interactions had begun to take on an emotional tenor, and had led to generalized beliefs about one another's abilities and competence, these tools proved ineffective. Negative spirals of emotion and cognition ensured differences could not be resolved by attempting to change the way that others thought.

For instance, following their early clashes, RD developers prepared reports aimed at persuading SusTech technologists to think about the development as a real-estate project. "I've spent a number of hours with [SusTech's chief technologist] to try and help him understand what we would normally do," a developer explained. But these practices did not yield the hoped-for results. "I feel that [the technologists] haven't really been listening to us for the last three or four months," he continued. He believed that SusTech technologists were not listening because of their inability to understand the

project (a perspective that emphasized differences and judged their competence): “There’s no really reality that’s supporting their ideas.” A SusTech executive, in contrast, explained that RD developers could not propose effective solutions for SusTech City because “they are like any other developer,” conservative and incapable of thinking innovatively. In a company-wide meeting, John explained: “The characteristics of the individuals from RD didn’t help us. It hasn’t translated into a positive relationship for us – in fact, quite the opposite.”

At GreenMarket, awareness of project difficulties led project leaders to institute a co-location policy, whereby individuals making decisions and working on joint tasks began to share a physical location. Tim explained his reasoning for this decision, and emphasized the negative emotions that had begun to build around the project: “You have to understand that everybody has been very frustrated for a variety of reasons with the way things have been…. We have been rubbing each other the wrong way.” He explained how he believed the answer would lie in co-locating in order to increase communication, build understanding of one another, and develop shared knowledge:

> We realized that we’re actually not understanding each other, and that's the problem. We got together and we talked about it. And in that conversation we were able to shift the focus from competence to communication. And in that conversation, the idea of co-location was born.

Had differences between actors at GreenMarket been purely cognitive, they could, perhaps, have been resolved through co-location. However, the data suggest that co-location did not produce fewer framing clashes; early framing clashes had led to spirals of negative emotions and unfavorable attributions that co-location could not resolve. A Casilla developer explained her thoughts on co-location with audible frustration:

> Developer: The engineers and architects didn’t like to listen to us. They wanted to work on their own – don’t come here, don’t tell us, we know how to do it. They should have been more willing and more open to collaborating. Normally, when we are doing projects, it’s really co-planning and co-creation. We are sitting at the same side of the table with our planners and designers. We’re really working together – so these architects and engineers, they really know us, and what we want, and what is the situation, and what are the constraints. But they weren’t open to that.

> Researcher: Has co-location helped?
> Developer: *[hesitates]* Sure, it helped.
> Researcher: Do you feel that this is now an effective collaboration?
> Developer: No. We have gotten the message quite strongly from their side that this wasn't a real collaboration.

Similarly, an architect described the co-location as, "In a way, an emergency." He explained: "The way it was practiced was a crook for other things which did not work very well in the project…. And by the time we got that going, it was too late for me. It was really about trying to minimize the damage." He went on to describe his disappointment with GreenMarket, and explained how the project's shortcomings could be blamed on others:

> There were some aspects which we considered true to the GreenMarket project that could not be implemented at the end of the day, because they were against some goals the other clients had. It was a slow process – it was not this way from day one. But very, very slowly – it went and went.

Had framing clashes simply revealed differences in the ways individuals thought about each project, they might have been overcome through framing practices or tools aimed at changing the way particular groups viewed the project and one another. But because negative emotions led to strong, generalized attitudes about others' identity and competence, and because emotions and attitudes resulted in pervasive feelings of mistrust, collaboration became impossible. "The apt title for what we just went through," a Telavera designer explained, "is systemic failure."

2.4 Discussion

This chapter builds new theory on why innovation under conditions of extreme ambiguity, and especially in nascent industries, can be so difficult. I develop a process model of *framing clashes* that reveals the connection between ambiguity, frames, and negative emotions. In doing so, I show how unstable categories can result in divergent frames around a project's purpose. These frames, in turn, can give rise to emotional processes that spiral downward to derail innovative projects. Although transitory,

negative emotions can shape stable negative attitudes about others working on the project: individuals begin to view each other as fundamentally different and questionably competent. Early framing clashes can thus give rise to dangerous spirals that result in a pervasive atmosphere of mistrust and disillusionment, and set the stage for damaging project outcomes. These spirals are illustrated in Figure 2.2.

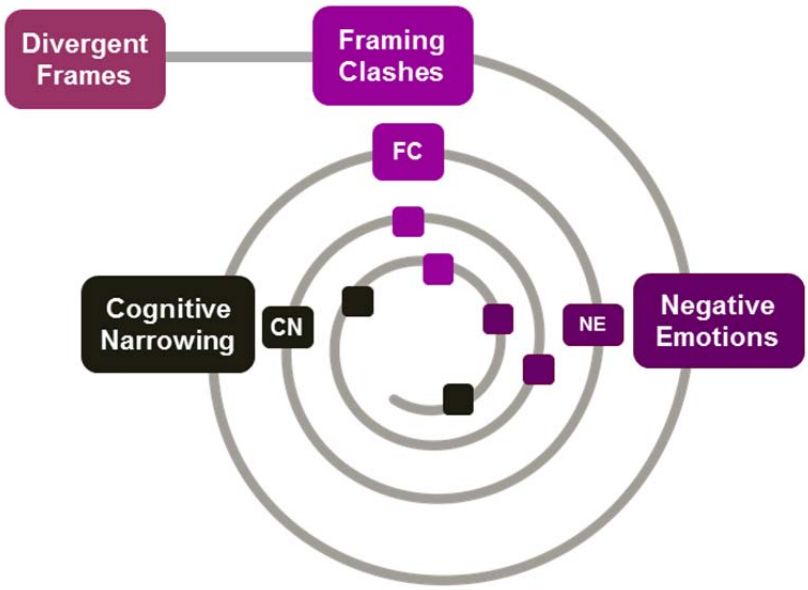

Figure 2.2: A Process Model of Framing Clashes

Frames are typically conceptualized as cognitive structures, with little attention paid to their emotional importance or resonance (e.g. Huff 1990; Fiol and Huff, 1992; Wash, 1995; Barr, 1998; Porac and Thomas, 2002; Kaplan, 2008). This research indicates that the experience of decision-making between individuals with divergent frames is highly emotional. When frames clash, individuals become frustrated by having to work with others who do not understand the true meaning of the project; they become disappointed and contemptuous when decisions threaten their views of the project or their own role in it. Over time, as negative emotions build, they give rise to cognitive narrowing and negative attitudes. Cognition and emotion become intertwined in dangerous spirals that can threaten innovation.

This analysis thus sheds light on a critical difficulty of innovation and strategic decision-making in nascent industries, where differences intended to promote innovation can become entrenched as barriers that hamper it. When frames clash, decision points that appear, on the surface, like simple strategic choices – projections around financial figures, a choice of building materials – become infused with such emotional value that they begin to shape actors' attitudes about each other and the project itself. The very expertise needed to innovate effectively can result in divergent frames and thus negative emotional responses. Unpacking the process by which this occurs is perhaps a first step in building understanding of how to lead and manage resilient, effective projects and ventures in ambiguous settings.

2.4.1 Implications for Theory

First, this chapter adds to the literature on innovation and strategic decision-making in nascent industries. This analysis suggests that one of the challenges of this ambiguous contexts is managing the negative emotions that accompany frames. Scholars have indicated that launching ventures is nascent industries is extremely difficult (Aldrich and Fiol, 1994; Aldrich and Ruef, 2006; Santos and Eisenhardt,

2009), but few studies have explored the internal dynamics of projects or firms in this ambiguous context. This chapter suggests an internal reason this context might be particularly challenging.

Second, this chapter extends research on behavioral strategy by offering a systemic, consequential view of emotions in strategic decision-making and innovation (Huy, 2012). This analysis suggests that emotions arise through patterned causes and have important, observable effects. It thus falls squarely in the stream of research that emphasizes the importance of emotion for managerial and strategic outcomes (Huy, 1999; 2002; 2011; Maitlis and Ozcelik, 2004; Sanchez-Burks and Huy, 2009). The idea that managerial cognition has deep implications for performance is well-accepted in behavioral strategy (e.g. Daft and Weick, 1984; Huff, 1990; Walsh, 1995; Barr, 1998; Tripsas and Gavetti, 2000; Kaplan, 2008; Tripsas, 2009; Gavetti, 2012). Yet, as Huy (2012) argued, the idea that emotions matter remains "in the periphery of the strategic management literature" (240). By suggesting that, in certain contexts, cognition and emotion are intertwined, and that emotions play a central role in shaping outcomes, this chapter can perhaps help motivate a move from the periphery to the mainstream.

2.4.2 Implications for Practice

This chapter also has significant implications for practice. Even within a single organization, individuals can hold different frames based on their backgrounds or professions (Simon, 1947; March and Simon, 1958; Kaplan, 2008; Leonardi, 2011). During periods marked by high ambiguity, when interpretations about the purpose of the organization are up for grabs – including, for instance, periods of profound organizational change, or post-merger integrations (Gioia and Chittipeddi, 1991; Reger *et al.,* 1994) – decision points might unearth divergent frames, and thus lead to negative emotions. Decisions that should be unproblematic are likely to take on emotional significance. Understanding how this might occur is critical in preventing break-downs in decision-making and collaboration.

By elucidating the mechanisms that connect divergent frames, emotions, and outcomes, the chapter suggests potential interventions. Because of a lack of successful interventions in the data, these propositions are merely suggestive; nonetheless, they can be tested and refined in future research. First, this chapter implies that diversity of background and expertise might be beneficial insofar as actors clarify and discuss their frames about a project or a venture's aim and meaning. Importantly, individuals at SusTech City and GreenMarket did not explicitly acknowledge their divergent frames or different visions of the project's aims; instead, frames were taken for granted. This analysis suggests that leaders of innovation projects and in nascent industries should take great care to make explicit each individual's frames about the project. In doing so, they can prevent differences in frames from manifesting in emotional processes that lead to self-sealing, negative attitudes. Moreover, through early efforts to share frames, leaders can also attempt to integrate across them by establishing a joint frame or interpretation that can guide future decisions. These efforts might lead to collective re-conceptualizations of the project, and perhaps even to new and better ideas about the project itself (Hargadon and Bechky, 2006).

Moreover, this chapter suggests that, once the emotional and cognitive dynamics of framing clashes begin to unfold, processes and tools often used to clarify differences and build shared understandings – boundary-spanners, framing practices, co-location – may no longer be sufficient. This suggests that efforts to build shared frames are necessary in the earliest stages of a project.

This chapter also implies that leaders can attempt to avoid the destructive effects of divergent frames by taking care that negative emotions do not result in the formation of stable attitudes. Psychological research has shown that regulation processes, such as individual and group norms, can override automatic processing of emotion (e.g. Frijda, 1986; Grandey, 2000; Gross, 2001); this implies that negative emotions need not always result in negative attitudes. At the same time, suppressing or ignoring negative emotions within organizations can have disastrous, explosive effects, whereby

negative emotions and dysfunctional behaviors are only amplified (Gross, 1998; 2001; Maitlis and Ozcelik, 2004; Elfenbein, 2007). Together, this suggests that leaders should pay attention to the emotional experiences of individuals developing innovative projects characterized by high ambiguity. If and when negative emotions begin to manifest, leaders can attempt to manage their effects on attitudes. This can be done through re-appraisal (Ashforth and Humphrey, 1995; Gross, 1998): leaders could, for instance, take care to address emotional concerns, and emphasize that the emotionality of a project is due to high ambiguity, and not due to the involvement of diverse individuals. Future work can test – through qualitative explorations, lab studies, or even interventions and action research – whether and how leaders can intervene to prevent damaging emotional spirals and the formation of negative attitudes.

2.5 Conclusion

Innovation projects in nascent industries can give rise to transformative outcomes. In these contexts, the most effective solutions might come from collaboration between individuals from diverse professions and industries. To succeed, these individuals must learn to work with diverse others despite facing significant ambiguity. This requires managing divergent frames and therefore confronting negative emotions. By unearthing the process by which divergent frames shape emotions, attitudes, and thus innovation, this chapter opens the possibility for future work that can further explore these important challenges.

CHAPTER THREE

THE DOWNSIDE OF LEGITIMACY BUILDING FOR A NEW FIRM IN A NASCENT INDUSTRY

3.1 Introduction

To succeed in new or rapidly changing contexts, organizations must develop an ability to learn (Senge, 1990). Organizations learn through the actions and interactions of their members with one another and with their environment (Edmondson, 2002); these individuals must accumulate and reflect on new information so that their organization can respond to changes, risks, and opportunities in the environment (Edmondson, 2002). Understanding and managing processes that promote or impede organizational learning is essential to building effective organizations that survive and thrive over time (e.g. Argyris and Schoen, 1978; Levitt and March, 1988; Edmondson, 2002).

3.1.1 Organizational Learning in a Nascent Industry

An ability to learn is especially critical for new firms struggling to find a viable path forward, and even more so in the ambiguous context of a new industry. New firms lack well-developed stocks of routinized knowledge they can rely on to make sense of and respond to environmental threats and opportunities (Gavetti and Rivkin, 2007). To adapt and change in response to the environment, they must build new knowledge about and routines for attending to, reflecting on, and responding to information. Successful new firms are those that frequently assess and evaluate the environment, along with their internal capabilities and business models, then act quickly in response to this new knowledge in learning loops, via continuous change (Brown and Eisenhardt, 1997), opportunistic adaptation (Bhide, 2000), or continuous morphing (Rindova and Kotha, 2001).

Nascent industries demand especially rapid learning. Firms in nascent industries cannot rely on proven business models or stabilized paradigms; knowledge about competitors, customers, and

technologies is initially incomplete (Aldrich and Fiol, 1994; Aldrich and Ruef, 2006; Santos and Eisenhardt, 2009; Benner and Tripsas, 2012). Moreover, nascent industries shift rapidly in ways that are difficult – if not impossible – to predict (Dobrev and Gotsopouls, 2010). Unable to rely on established, taken-for-granted knowledge, and facing a rapidly shifting environment, entrepreneurs and leaders in nascent industries must continually build and update their understanding of the market as it takes shape, and assess their capabilities to determine the fit or misfit between the two (Aldrich and Ruef, 2006). Only by learning – attempting to improve their actions through this knowledge and understanding (Fiol and Lyles, 1985; Garvin, 2000; Edmonson, 2002) – can new firms survive and thrive (Aldrich and Ruef, 2006). As Gavetti and Rivkin (2007) wrote, "young firms in new industries get lucky, get cognitive, or get dead" (434).

3.1.2 Building Legitimacy in a Nascent Industry

Most research on new firms in nascent industries has neglected learning, focusing instead on the importance of legitimacy-building (e.g. Aldrich and Fiol, 1994; Kennedy, 2008; Navis and Glynn, 2010; Wry et al., 2011). An industry in its earliest phases of development lacks understanding, endorsement, and support of external stakeholders. New firms operating in this context lack both sociopolitical and constitutive legitimacy (sometimes termed cognitive legitimacy). Socio-politically, the firms lack the regulatory or legal acceptance of external stakeholders (DiMaggio and Powell, 1983; Aldrich and Fiol, 1994). Constitutively, their forms and practices are not yet taken-for-granted; customers lack understanding of and knowledge about the desirability or potential use for the products or services they offer (Meyer and Rowan, 1977; Hannan and Carroll, 1992; Aldrich and Fiol, 1994; Dobrev and Gotsopoulos, 2010). Entrepreneurial success therefore can depend on the development and deployment of strategies that help legitimate both a new firm (e.g. Rindova et al., 2007; Kennedy, 2008; Santos and Eisenhardt, 2009) and its nascent industry (e.g. Navis and Glynn, 2010).

Recent theory raises the possibility that the actions a firm takes to build legitimacy might, over time, impede its internal development (Dobrev and Gotsopoulos, 2010). The forms this trade-off might take and the mechanisms through which it occurs have not yet been examined empirically. Research in behavioral strategy suggests that investment in one set of activities can affect a firm's development and survival in unintended ways through cognitive channels. Boundedly-rational leaders and entrepreneurs cannot focus on all aspects of the competitive environment at once (Simon, 1947; Ocasio, 1997); focus on one set of activities can inhibit cognitive processes that enable leaders and entrepreneurs to recognize unrelated opportunities for change (Tripsas and Gavetti, 2000; Danneels, 2003; Eggers and Kaplan, 2009; Tripsas, 2009) We build on this line of thinking to propose a trade-off, rooted in cognition, between legitimation and learning in nascent industries.

3.1.3 Overview of the Present Study

Through in-depth, longitudinal research at a (disguised) firm in the nascent *smart cities* industry, we found that the firm's leaders engaged in legitimacy-building activities in a manner consistent with recommendations in prior literature. We also discovered that legitimation activities gave rise to three cognitive effects that blocked learning. We propose three individual-level, cognitive effects of a firm's leaders' attempt to build legitimacy – unexamined by prior literature – and explain how they can constrain the ability to seek out, reflect on, and respond to new information, inhibiting firm learning. As theorized in prior literature, our data do indicate that legitimation activities lead to fast, tangible results. In contrast, the cognitive effects of legitimation accrue over time. Because of this imbalance, entrepreneurs in nascent industries might be tempted to invest an increasing amount in legitimation activities, without noticing their negative effects.

An important implication of our work is that nascent industries are risky contexts due to features of human cognition, not only because of industry- and firm-level properties. We show that the

limitations of human cognition mean that the pursuit of legitimation – often seen as essential – can affect leaders and entrepreneurs in ways that limit the firm's success. By elucidating the cognitive mechanisms that connect legitimation and learning, we build theory on processes that can help entrepreneurs and leaders manage the tension between the two. In doing so, we contribute to the growing stream of research in behavioral strategy that emphasizes the cognitive underpinnings of firm behavior and performance (Powell, Lovallo and Fox, 2011).

3.2 Theoretical Background

Because of a low number of firms, firms in a nascent industry lack *constitutive legitimacy* (Hannan and Freeman, 1989; Hannan and Carroll, 1992), defined as "the extent to which a process or organization meets the taken-for-granted assumptions of a given constituency" (Sine and David, 2010: 5). Prospective partners, customers, and shareholders might not understand the need for the industry, and whether or how it will develop. In the least extreme contexts, stakeholders might not recognize the potential value in the products or services offered by firms in the new industry; in the most extreme contexts, stakeholders might question their moral desirability.

At the same time, entrepreneurs and leaders in nascent industries lack coherent paradigms and accepted templates for how to compete (Aldrich and Fiol, 1994; Aldrich and Ruef, 2006; Santos and Eisenhardt, 2009); they face considerable ambiguity when they try to develop a business model about competitors, customers, products, or technologies. Moreover, nascent industries can shift rapidly in directions that are impossible to predict (Dobrev and Gotsopoulos, 2010). Effective ways to create, deliver, and appropriate might change radically over time; sustained success might depend on developing the ability to adapt and pivot internal capabilities and resources deftly.

These challenges present different imperatives for strategic action. Without the constitutive legitimacy that comes with being one of many firms or institutions, leaders in nascent industries may

invest time and resources into developing symbolic strategies to justify their firms and industries to external constituents (Rindova et al., 2007; Dobrev and Gotsopoulos, 2010; Navis and Glynn, 2010; Zimmerman and Zeits, 2010). Building legitimacy depends on "find[ing] strategies to raise the level of public knowledge" about their firms and industries "to the point where people take [them] for granted" (Aldrich and Ruef, 2006: 187). These strategies include investing time and resources in activities that allow leaders to "build a reputation of the new industry as a reality, as something that naturally should be taken for granted by others" (Aldrich and Fiol, 1994: 657). These activities include the crafting and dissemination of stories that balance uniqueness and embeddedness in existing models (Lounsbury and Glynn, 2001; Martens, Jennings, and Jennings, 2007; Santos and Eisenhardt, 2009; Navis and Glynn, 2010; Wry et al., 2011; Khaire, 2013); the use of analogies, templates, and metaphors to explain and rationalize new firms and nascent industries (Hill and Levenhagen, 1995; Santos and Eisenhardt, 2009; Cornelissen and Clarke, 2010); the engagement of the press and media, who can help spread legitimating stories (Rindova et al., 2007; Kennedy, 2008); and affiliations with and certification from prominent partners and institutions, who can signal status and thus help build legitimacy (David et al., 2012). The leaders of XM and Sirius, for instance, engaged in all of these symbolic activities to legitimate first the nascent satellite radio market and then their own firms (Navis and Glynn, 2010).

3.2.1 Cognitive Effects of Legitimation Activities

How legitimation activities may affect the cognitive structures of firm managers, with implications for the firm's ability to learn, has not been explored in prior research. Although strategy research has shown that investment in specific activities and strategies cognitively constrains leaders and entrepreneurs (e.g. Ocasio, 1997; Tripsas and Gavetti, 2000; Danneels, 2003; Gavetti and Rivkin, 2007; Tripsas, 2009), institutional research's focus on legitimation as an essential outcome (e.g. Navis and Glynn, 2010) has limited attention to the potentially constraining effects of legitimacy-building

activities. At the same time, strategy research on nascent industries has largely ignored both legitimacy and cognition, focusing instead on whether firms enter, when they enter, and whether they survive (e.g. Mitchell, 1989; Mitchell, 1991; Klepper and Simons, 2000; Dowell and Swaminathan, 2006). Neither stream explores whether and how legitimacy-building impacts individual-level cognition, nor how such cognition affects firm success and outcomes.

Activities that constrain cognition might be especially dangerous in the ambiguous context of nascent industries. Given a lack of existing knowledge and templates and a rapidly shifting context, firms in nascent industries need to learn quickly in order to develop and test new business models and products capable of responding to changes in the environment (Aldrich and Ruef, 2006). If firm leaders and members fail to build, reflect on, or respond to new information, the firm is unlikely to develop this ability. Learning depends on cognitive flexibility and reflexive thinking – the ability of firm leaders and members to build new knowledge through rapid testing of their assumptions, to seek out and attend to data about their environment and their performance and progress, and to reflect on these data to adapt their actions (Edmondson, 2002; 2011) – which might be constrained through unintended cognitive channels.

Attending to a nascent industry's lack of legitimacy thus might interfere with firm attempts to attend to the need to engage in rapid learning. In fact, Dobrev and Gotsopoulos (2010) recently argued that legitimation activities can interfere with a firm's attempts to respond and adapt to a dynamic environment; however, the mechanisms through which this trade-off occurs have not been explored. By elucidating these mechanisms, we hope to build theory on how leaders and managers can balance legitimation and learning.

3.2.2 Our Contribution

By exploring how a firm's attempts to shape its institutional environment affect its internal development, we build on research in behavioral strategy, and respond to recent calls for research integrating institutional, strategic, and cognitive perspectives (Durand, 2012). Our study suggests that activities aimed at legitimating a firm and an industry can impact the firm's internal development through three unintended cognitive channels that hinder learning. An early entrant in the nascent *smart cities* industry, SusTech invested in legitimation activities – routines, practices, and processes to help stakeholders understand and appreciate the firm and its industry – that have been conceptualized as beneficial by prior literature. We identify three unintended consequences of engaging in these activities; *constrained attention*, *overconfidence*, and *identity commitments*. More specifically, as an apparent result of external legitimacy-building activities, firm managers under-invested in internal activities, inhibiting their ability to seek out and build up new knowledge. They became overconfident and resistant to negative feedback, which affected their ability to reflect on external information; they also formed deep identity-based attachments to a particular course of action, which affected their ability to respond to that information. We thus propose that understanding the cognitive and behavioral effects of legitimation and other strategic actions can give rise to new theory, and thereby better recommendations, related to entrepreneurial action in nascent industries.

3.3 Method

We used a longitudinal, in-depth qualitative research design to generate new theory, consistent with the paucity of literature on the cognitive impact of legitimation activities and on the connection between legitimation and learning (Edmondson and McManus, 2007). SusTech provides a revelatory case (Yin, 2003). We began our research intending to study how entrepreneurs in a nascent industry learn. As our research unfolded, we recognized that SusTech leaders and members often failed to attend

and react to new knowledge and data. At the same time, we noted that they engaged in a number of activities aimed at legitimating the firm and its industry. We thus focused our analysis on both learning and legitimation and their relationship. We were able to do this because SusTech provided extensive access to difficult-to-obtain longitudinal data. By observing and tracking the firm's development in real-time over a period of three years, we were able to appreciate the deep, cognitive, anticipated and unanticipated longitudinal effects of decisions and activities. As Siggelkow (2007) argued, this "rich longitudinal research" allowed us to "provide the details of how…[dynamic] processes actually play out" over time (22).

We chose a case study design rather than a multiple-site comparison to develop understanding of the complex process linking legitimation activities to internal development, before attempting to explain possible variation across sites (Eisenhardt, 1989a; Eisenhardt and Graebner, 2007). We argue that our study can provide a "very powerful example" from a single organization (Siggelkow, 2007: 20). Thus, we do not attempt to generalize our findings to all firms in nascent industries. Instead, our study reveals the cognitive effects of legitimacy-building that managers, entrepreneurs, and scholars should consider when building or studying a firm in a nascent industry. Future research can attempt to extend, modify, or test our findings on a larger sample of firms.

3.3.1 Research Setting: The Smart Cities Industry

Like Chapter 2, this study was based on a company in the smart cities industry. When we began our research in late 2009, the industry was still in its nascent stages. Our background research on smart cities, described in Chapter 2, indicated that the industry began to develop in response to two broad social trends that pointed to cities as a domain for innovation. First, the world is rapidly urbanizing. The United Nations' 2007 urbanization report, for example, projected that 70% of the world's population would reside in cities by 2050. Second, a burgeoning public dialogue on climate change and

environmental risks gave rise to interest in sustainable development. These simultaneous trends led some global technology companies to recognize an opportunity to develop technological solutions that could make new and existing cities more sustainable. Some smaller companies developed specific technologies, for example, for managing traffic flows on city streets or for reducing energy consumption through sensors and automation systems. Larger companies tended to develop integrated solutions that could be deployed in entire cities. In the latter category, the most well-known included IBM's Smarter Cities and Cisco's Smart + Connected Communities initiatives. Several announced or began the development of new neighborhoods or cities, connected by smart networks that would deliver and optimize technologically-driven applications. According to a 2010 Cisco report, the aim was to "transform physical communities;" a smart cities approach encapsulated "a new way of thinking about how communities are designed, built, managed, and renewed to achieve social, economic, and environmental sustainability."

3.3.2 The Company

We conducted an inductive 36-month study of SusTech, a (disguised) firm based in Europe. While Chapter 2 focused on SusTech's reference project, SusTech City, this chapter focuses on an analysis of the firm itself. We were introduced to John Natley (a pseudonym), the Chief Executive Officer (CEO) and co-founder of SusTech, in 2009. Given our interest in nascent industries in general and smart cities in particular, we recognized SusTech as an ideal setting for grounded research. We began our research at the company in December 2009, introduced to employees and partners as researches tracking the development of the firm.

SusTech began operations in early 2008. The firm was founded by two former IT executives who identified an opportunity to apply technology to transform the built environment. Several years earlier, the pair had worked together on a large real-estate development project. Coming from the rapidly

shifting technology industry, they were struck by the observation that the construction industry hadn't experienced major innovation in decades. The two began to form an idea for a firm dedicated to, in Natley's words, "transforming the way the world constructs." They would apply information technology to the challenge of building intelligent urban structures efficiently.

The founders hoped to accomplish this aim through the development of a state-of-the-art urban new-build demonstration project, dubbed *SusTech City,* and further described in Chapter 2. SusTech City would serve as a showcase or prototype demonstrating sustainable, intelligent technological solutions. They believed solutions developed and tested there – including an "operating system" conceptualized as a smart grid using sensors to gather and use data about the environment to manage buildings efficiently – could be deployed in existing and new cities in the future.

When we began our research, SusTech employed a small team focused on developing SusTech City. Natley had worked with a local governmental leader who guaranteed access to a tract of unused land to house the project. SusTech employed 12 individuals who were working in a small hotel space near a large city and were paid only in stock. By the end of our research in October 2012, SusTech had grown to 50 employees before shrinking again to 25; the company had faced a constant stream of opportunities and challenges, from unanticipated projects in new bases to failed attempts at securing funding, exciting bouts of hiring to disappointing sequences of layoffs. By late 2011, the team had developed a conceptual master-plan, but had not yet begun building the City. Meanwhile, a growing technology team had developed a "lite" version of its operating system that could be demonstrated in smaller-scale implementations. The company began sending out this demonstration technology to its corporate partners in early 2012. Although the company had attracted a large number of well-known corporate partners to participate in the development of SusTech City (including real-estate developers and established technology companies), executives were often distraught by what they perceived as the slow pace of progress on the project.

3.3.3 Data Sources

We gathered data through several complementary sources to triangulate our findings. The authors and two research assistants visited SusTech 11 times, usually but not always in pairs, with visits ranging from five to 15 days. The authors spent about 50 full days in the field, taking extensive field notes during each visit. These included detailed notes on what was said, descriptions of how members interacted, and ongoing personal reflections on unfolding events. We transcribed each set of notes within two days of their initial notation.

SusTech's site provided extensive opportunities for observation of company operations, culture, and interactions. Employees worked in a spacious restaurant in a small hotel. Because the restaurant only served breakfast, the room was available for work and coffee throughout the rest of the day. With laptop computers set up around the periphery of the communal work space, informal encounters occurred in an unscheduled manner throughout the day, and SusTech employees constantly engaged with one another and with us. Being in the field entailed spending 18-hour days with members, engaging in activities from morning runs, to trips outside of the hotel for lunch, and dinner and drinks late into the evening. In these settings, we conducted informal interviews, taking limited notes and then writing down notable conversations as soon as possible. We also attended relevant meetings, including meetings between company members and representatives from potential partner companies, investors and the government, meetings of the executive team, and various other planning and strategy meetings. While away from the site, the primary author called in to a number of firm-wide operations meetings and board meetings. Overall, we observed 39 meetings, each ranging from 45 minutes to 3.5 hours. Finally, we attended a number of events where leaders presented the firm and its business model. Our frequent interactions with members allowed us to build the trust necessary to investigate sensitive, social phenomena. At the same time, we did not participate in operations or voice our opinions during meetings or conversations to avoid influencing the process we were studying.

In addition to our frequent informal interviews, we formally interviewed SusTech's founders, leaders, employees, and executives at partner companies. These semi-structured interviews ranged from 60 minutes to three hours, and were tape-recorded and transcribed. The interviews focused on the company's development; we questioned participants on their work, the challenges they faced, and the opportunities they foresaw. In total, we conducted 72 formal interviews with 38 individuals. By interviewing the same individuals in intervals over 36 months, we began to develop a thick description of the firm's decisions and activities from the point of view of its members, allowing us to triangulate our observational data. We also interviewed three former employees after they had left the company.

Finally, we gathered many internal documents from SusTech, including successive business plans and presentations made to investors and the government. These data allowed us to track changes in SusTech's business model and strategy. We were copied on many emails exchanged between the executive team, providing us with another way to track the firm's development. Our data includes 105 emails between SusTech's employees and executive team. Table 3.1 summarizes our data sources.

Table 3.1: Chapter 3 Data Sources

Formal interviews	
Founders and employees	57
Partners	15
Total	72
Observation	
Site visits	11
Meetings	39
Presentations	10
Approximate field hours	800+
Other	
Official documents	100+ pages
Email access	44 pages

3.3.4. Data Analysis

Our analysis was inductive. Iteration between data collection and analysis (Glaser and Strauss, 1967) resulted in surprises that shaped our contribution. As noted, we began our research with a general interest in how firms learn in a nascent context. Following an initial round of interviews and observations, we worked on a case study on SusTech to describe the firm's founding, time-line, evolving strategy, culture, and future perspectives. This case provided a foundation that allowed us to begin analyzing SusTech's evolution.

As our research unfolded, we engaged in cycles of open coding, where we analyzed the data for notable themes and patterns, both by thoroughly reading our notes and interview transcripts, and through the use of QSR NVivo, the qualitative data analysis software. We wrote a number of memos and papers tracking themes in the company's growth, and engaged in countless discussions about our codes and the company's progress. We began to recognize that, to our initial surprise, SusTech leaders and members often failed to attend and adapt to external feedback and information. At the same time, we noted that SusTech executives dedicated much of their time to spreading their vision for the firm and the industry through press releases, speeches, and publications. We began to explore the relationship between these two observations by probing more deeply into the data. At this point, we began to iterate between the data and the literature on nascent industries by comparing our unfolding findings to suggestions from prior literature. This comparison of the literature with our data led to the refinement of our research question, and we focused data collection and coding on exploring the relationship between legitimation and learning – unexplored by prior literature – until we felt we had fully captured the complex relationship between legitimation and learning.

3.4 The Effects of Legitimating a New Firm and its Nascent Industry

At the time of SusTech's founding, the smart cities industry was still nascent. Entrepreneurs and stakeholders were unsure of the potential size of the market; many shared the sense it would be determined by the success or failure of early industry pioneers. An article on smart cities (Lindsay, 2010) explained:

> The market is so new that no one can pinpoint the exact size of what's at stake. The best guess, offered by…[a] research firm… pegs the smart-infrastructure business at $122 billion over the next two years. A better answer may be: "How much have you got?"

Stakeholders also disagreed about the desirability and viability of smart city projects: although some reports likened the rise of smart cities to Silicon Valley and proclaimed city technologies would change lives in ways comparable to personal computers, others dismissed early efforts as a fad. A New York Times article, for instance, predicted that most smart city projects were likely to fail. Industry observers thus emphasized that success depended on convincing stakeholders of the industry's viability: a 2010 Forrester report noted that, to succeed, entrepreneurs and firms would have to overcome skepticism by developing "a solid value proposition" and "a hard sell to some stakeholders."

Moreover, entrepreneurs and leaders in the nascent industry developed and deployed different business models. An internal industry report from a private research institute explained that smart city projects:

> Are quite diverse in their approaches and objectives. In addition, business models within these projects for technology players are not entirely clear. Smart city is an umbrella concept for a variety of systems in a city, from energy and water to healthcare and education.

Some projects were attempts to sell smart software solutions to existing municipalities; others were all encompassing new cities, like SusTech City, intended to generate revenue through a combination of real-estate sales and technology services. An engineer from a global firm that had

worked on a number of smart city projects reflected that many of these firms and projects lacked a clear conception of how the market would develop in the future: "most have no conception of a strategy."

Amidst this ambiguity, SusTech executives saw the company as helping create the nascent smart cities industry. "If we succeed," an executive predicted in an interview, "we will become part of a new cluster of economic development – smart cities." An executive who had previously worked on the development of a successful small, energy-efficient urban automobile explained how the two efforts were alike:

> At the time, the niche didn't exist. There was no market…. And this is what we're trying to do with SusTech…. We are sending everybody on a journey on what a smart city could be. And nobody knows what a smart city is.

3.4.1 SusTech's Legitimation Activities

SusTech executives – particularly the firm's co-founder and CEO, John Natley – invested heavily in *legitimation activities*: routines, practices, and processes that aimed at legitimating the firm's value proposition and nascent industry. Executives believed these activities were necessary to thrive in the nascent industry for two reasons. First, external stakeholders did not understand the new industry; the industry lacked constitutive legitimacy. As one executive explained:

> You can compare this to the early days of computers. In the early days, the competition…was around getting everyone to accept the idea of the personal computer as a platform. And that's the stage where we are, with smart cities…. This is a new industry. That's something that takes a lot of energy, to communicate that – to any type of audience, whether its investors, corporations you want to partner with, governments, banks. It takes some time to get it across.

Second, as a growing number of firms entered the industry with different business models and value propositions, SusTech sought to distinguish itself from its competitors. Executives believed they could do distinguish themselves through symbolic activities that legitimated both the firm and its view of the industry. An executive explained:

> The main competition is the noise in the marketplace—people like [company X], who have huge marketing budgets, saying, 'We're doing smart city developments,' and actually, when you dig

> into it there [isn't much there]… There is confusion in this marketplace. 'Are we trying to do something like [company Y] or [company Z]?'.... We have to keep saying…that this is a different approach.

Legitimation activities comprised three sets of practices and processes. Executives crafted and refined a story about the firm and its industry. They disseminated the story through speeches, presentations, press releases, interviews, and other public actions to generate support from large technology companies, construction companies, government groups, and the public. They built a partnering process aimed at developing affiliations with prominent individuals, corporate partners, and institutions. Together, these activities helped build legitimacy, and thus helped attract employees and partners.

Crafting a Symbolic Story

Symbolic stories that draw on analogies (e.g. Hill and Levenhagen, 1995; Cornelissen and Clarke, 2010) can help leaders and entrepreneurs explain, rationalize, and legitimate their firms (Louinsbury and Glynn, 2001; Martens et al., 2007) and their nascent industries (Navis and Glynn, 2010; Wry et al., 2011). Our data show Natley and SusTech executives deliberately crafting SusTech's story in ways designed to legitimate both the firm and the smart cities industry. For instance, while helping prepare a presentation deck for investors in mid-2010, Natley told two employees the "story" he wanted the deck to communicate: "This is a big idea. It's like sitting here thinking, I want a PC on every desk. That's my city… We will make buildings more efficient in the same way that computers [made work more efficient]." Executives thought about ways to refine and re-work the story; for instance, in a 2010 email to the executive team, SusTech's co-founder noted:

> Our story rambles and embraces far too much at this stage… Help me in getting our story succinct. I think each of us should try and get the story down to one page as we individually understand it… and then each of us will have a great elevator pitch.

Leaders and entrepreneurs also often use accounts that emphasize inconsistencies between

social ideals and the status quo to drive legitimacy for their ventures (Rao, Monin, and Durand, 2003; David et al., 2012). When relaying SusTech's story, Natley and other executives would begin by problematizing the present: noting that the world is increasingly urbanizing, and the construction industry is not producing solutions that can meet the demands of an urban population at risk of depleting the world's natural resources. Speaking in front of a crowd of hundreds at a major school of architecture in the United States, Natley stressed that a "huge cognitive shift" was needed – a new way of thinking about cities. SusTech's story stressed that the firm would transform the problematic present with new information technologies. During a press event in 2010, for instance, Natley spoke about problems in the way cities are built and managed, and stressed that the company's vision for SusTech City could transform this problem: "What we are doing with SusTech City is about more than just the city. It's about innovation and technology; it's a vision that can create innovative cities to solve problems of present." In emphasizing this idea, SusTech's story used analogies between smart cities and prior new technology breakthroughs. In a 2012 speech, Natley displayed his iPhone and explained that a city could be thought of as a platform where different companies build applications that make it intelligent and sustainable. The potential for smart cities was as broad as the possibilities for the iPhone had proven to be: "Apple wasn't thinking about healthcare when they designed the iPhone," he stated, "but now there are one million health care applications for it. We can apply this approach to urban environments" to solve major problems related to urbanization.

The SusTech story also positioned the company as a leader in the smart city space. Telling the story, executives often emphasized the vital role that solutions the company was developing would play in shaping the smart city market. During the aforementioned speech, Natley emphasized that the firm's (still undeveloped) operating system will "support shifting urban lifestyles," redefining "the meaning of cities." Executives also emphasized the future impact of SusTech City, envisioned as one of the first smart cities in the world. "Nobody has built a smart city yet," an executive told us in an interview. "We

will be the first ones." An executive described these activities as part of a deliberate strategy: "We need to freeze the market – and that means telling them we have the solution even if it will take us years."

Disseminating the Symbolic Story

Favorable media coverage is critical to developing legitimacy for new organizational forms and practices (Rao et al., 2003; Rindova et al., 2007; Kennedy, 2008). Natley and other executives spent considerable time with the press, spreading SusTech's story. Natley frequently gave press interviews, along with speeches and presentations at conferences and elsewhere, including (among many other instances) a speech to business school students in 2010, a presentation at a business-to-business event hosted by a global technology company in 2011, and a press event announcing several critical partnerships in 2012. In an interview in mid-2012, Natley described some of these efforts:

> We've had quite a lot of press, which is a good thing…. We're holding an event [on smart cities], and I think we'll be oversubscribed on that…. When people are willing to spend money to come to your event, it's quite a good sign. It's interesting – in the last few weeks, I've had 8 or 10 speaking engagements where they paid us to present, paid for our travel. That's generally a good sign that you're at least somewhat credible.

Affiliating with Prominent Partners

Affiliating with prominent third parties can imbue firms and even industries with legitimacy (e.g. Stuart, Hoang, and Hybels, 1999; Khaire, 2009; Navis and Glynn, 2010; David et al., 2012). Natley and SusTech executives frequently talked to executives at major firms in an attempt to attract prominent advisors and corporate partners. Nearly all of SusTech's operations meetings began with an update on partnerships, and many employees worked on developing what they termed a "partnering process" for contacting, attracting, and managing partner relationships effectively. The company website prominently displayed names of corporate partners and individual advisors. Executives explained that the purpose of many of these affiliations was legitimating the firm. Our partners can bring us "validation

and credibility," one executive stated during an internal operations meeting. Similarly, in a 2010 board meeting, an executive spoke of the importance of SusTech's recent partnership with TechCo, a globally-known technology company: "We are in a great position, especially with the TechCo deal. Everyone will sit up if TechCo is in." Corporate partners even acknowledged the legitimating impact of these efforts. For instance, one executive at a renowned real-estate development company told us, "We know SusTech has leveraged the association with us very highly…. They were able to go out to the market and say they were in cahoots with us and they were looking to make sustainable cities work with us."

3.4.2 The External Impact of SusTech's Legitimation Activities

The legitimation practices and processes observed at SusTech appeared to have the intended effects. Natley and SusTech's executives successfully drew on symbols to craft a story that became a resource they tried to leverage and manipulate. Their efforts resulted in several articles in respected publications, and led to Natley and SusTech being featured in a documentary film on smart cities. The efforts to affiliate led to relationships with well-known individuals and companies. Table 3.2 summarizes the legitimation activities and their effects.

Table 3.2: SusTech's Legitimation Activities

	Practices/Processes	Outcome
Crafting a symbolic story	Symbols manipulated to create and refine a symbolic story: • Problematized present • Analogy-driven vision of future • SusTech as referent	Story became resource in developing further legitimation activities.
Disseminating the symbolic story	Giving speeches and presentations; holding press events; granting interviews and spending time with press members.	SusTech frequently mentioned in press and analyst reports on smart cities; Natley and executives invited to present and speak at prominent events.
Affiliating with prominent individuals and corporate partners	Developing a 'partnering process;' meeting frequently with potential partners; emphasizing affiliations in other activities.	SusTech attracted a number of prominent individual and corporate partners.

Taken together, these activities helped legitimate the firm, its proposition, and even its industry. Legitimation was important for a number of reasons. First, the firm managed to attract a number of employees, motivated by SusTech's story and its media prominence and high-status partnerships. A former employee told us that he joined the company because he was excited by the idea of the smart city industry, and saw SusTech as a vehicle for the idea:

> The idea is absolutely compelling…. And that's why everybody gets involved: the idea is compelling; it's solving a big problem. It could be a good way of going forward for…cities in the future. That's why I joined; that's why everyone joined.

The Chairman of the SusTech Board of Directors told us that employees were motivated because "there's a sense of excitement that we're at the beginning of a transformation in the way we see and build urban communities." An employee described how SusTech's story, participation in events, and high-status affiliations, attracted her to the company:

> I met with John the day we won the business plan competition… He was the head of the finals of one of the most important business plan competitions in Europe… And he was interested in hiring me…. When I looked at the website, I thought this company was incredible…. The project itself made complete sense. It was going in the right direction, trying to improve cities, trying to improve the social and environmental side of cities. It was something that was doing good for the world… [Meeting SusTech's prominent advisors] made me believe in the project even

> more… [I thought] if all those experienced people are working there, it must be something incredible.

Furthermore, the firm managed to attract high-status corporate partners. Like SusTech's employees, executives in these firms were motivated by the perceived inevitability of SusTech's vision, as relayed through its story. Partners were also attracted by the company's existing affiliations, which signaled competence and quality. Natley and fellow executives emphasized their affiliations in meetings, presentations, and interviews. For instance, Natley began a meeting with a major national utilities company by stating: "I'm telling you this confidentially, but TechCo has agreed to become a major partner significantly invested" in SusTech's success. These activities helped legitimate both the firm and the nascent smart city industry, as potential partners began to believe the firm's story of the industry's inevitable emergence. An executive at a global engineering firm reasoned:

> It will be a challenge, but someone, somewhere is going to build a smart city. It will happen. Being the first team to do it will be pretty huge, and there's no reason that John and SusTech couldn't be at the forefront.

During a staff meeting in late 2012, the SusTech Board Chairman highlighted the importance of legitimation. "We helped to create the smart cities industry," he told the team; "we have carved out a niche that is bigger than us." In an interview, he described the impact of the firm's legitimation activities:

> People are now beginning to realize they can't just talk about smart cities and [then] build un-smart cities…. It's becoming an accepted norm that the next generation of construction and urban development needs to incorporate technology.

During a strategy meeting in late 2012, Natley emphasized how these activities had turned SusTech into a cognitive referent (Santos and Eisenhardt, 2009) in the market:

> We've become synonymous with smart cities. I get calls from journalists and analysts all the time. Whenever there is a key article in the smart cities space, we always get called. Without a question, we are one of the first companies in the world that people call when they want to learn about smart cities

3.4.3 Cognitive Effects of Legitimation

Our analysis further revealed that SusTech's legitimation activities had three cognitive effects with powerful implications for the firm's ability to learn. First, the attention and resources attention executives and employees devoted to legitimation activities limited those devoted to internal activities like developing and testing technology. Attentional constraints prevented them from building new knowledge. Second, SusTech's frequently disseminated story led to overconfidence, whereby employees dismissed negative feedback as mere ignorance of the new industry. Overconfidence constrained their ability to reflect thoughtfully on new information. Third, these activities led to premature identity commitments that solidified employee attachments to courses of action with unproven value. Identity commitments ensured that, even when information was noticed and evaluated, leaders and employees could not respond to it. Our analysis suggests these cognitive effects limited employees' ability to attend to, process, and act on new knowledge and information; together, they constrained SusTech's ability to learn.

Constrained Attention

Managers can only dedicate attention to part of their environment at any given time, and attention may be path-dependent (Ocasio, 1997). By focusing heavily on legitimation activities, SusTech executives left little time for internal development. Rather than gathering external feedback about their actions or performance, or testing their business model and technology through learning loops typical of successful entrepreneurs (e.g. Brown and Eisenhardt, 1997; Bhide, 2000), SusTech executives devoted time and attention to disseminating their story and partnering with prominent stakeholders. As a result, they did not build up or attend to new knowledge about their environment, their internal capabilities, and the fit or misfit between the two. In interviews, many employees echoed one who said Natley in particular and the executive team more generally focused on "explaining our vision to the outside

world" rather than on testing and gathering feedback about that vision. In 2012, Natley explained his priorities in a similar way: "The …years up to last year – 2011 – were about working with the analyst community and press to start to communicate our vision much more aggressively."

Leaders' attention to legitimation led to a relative neglect of internal development. As observers at SusTech, we witnessed a number of instances where internal meetings were delayed or cancelled because of external legitimation activities. A former associate described a time that he worked on finalizing projections for the company's business model; "the future of the company is in your hands," an executive told him. However, he was unable to reach Natley – who was traveling for a conference where he delivered a keynote speech about SusTech and the smart cities industry – to "bless" the finished plan, which remained unattended to for several days.

Executives' external focus also led them to view the firm's resources and employees through a legitimation lens. The company hired a number of well-known executives and advisors, and emphasized these affiliations in its legitimation efforts. During a meeting with a prospective partner in 2010, for instance, Natley emphasized that the company had "just hired full-time [an extremely well-known entrepreneur's] chief architect and chief engineer." However, these individuals rarely worked on developing the firm's technology. Reflecting on the company's progress in 2012, its Chief Operating Officer (COO) explained:

> Even the tech people who were hired were famous. We hired people that had a good resume to show outsiders, 'Look at who we have involved behind us.' But they were people in their 40s and 50s who [did not] sit and code. It was great to show that we've got a world class organization…[but it wasn't able] to deliver technology [quickly].

One young employee explained how this hiring impacted the company internally:

> The composition of the team was unbalanced. All we had were senior people…. For a young company, you need a lot of doers to have something tangible….All the managers were just discussing the technology when they should have been getting their hands dirty and just building it.

Further, executives' narrow focus of attention led them to dedicate employees to the development of legitimation activities. During a 2010 prioritization meeting, SusTech executives allotted nearly half of the employees to communication and building partnerships. This focus left employees with little time to develop the firm's technology. "We have too many partners to take care of," a senior executive stated. SusTech's Chief Technology Officer described a young engineer who had initially come in to work on technology development: "I would have been happy to have him as part of the corporate technology team, but [another executive] managed to persuade him that his future was in partner management."

This narrowing of attention and resulting pattern of hiring and employee deployment did help build legitimacy for the firm. Media reports on SusTech's efforts stressed the company's senior hires and renowned partners, emphasizing that the involvement of this broad spectrum of experts indicated that, in the words of one report, "cities…will make the world smart." But executives' narrow focus of attention also meant employees did not attempt to build knowledge about the environment or about the viability of their technologies and business model. According to external partners and some employees, because of its inattention to internal development, hiring of executives, and focus on partnering, SusTech was slow to prototype and test its technologies. SusTech's COO described how the company failed to test its business model or technologies to gather information about their potential viability: "We were waiting until the big vision was baked and ready." A former employee described how she decided to leave the company after realizing "we have a great vision, but there is not much tangible there." In 2012, SusTech's COO directly attributed this lack of development to SusTech's attention to legitimation. "The company is a great name and marketing-wise has done tremendously, but it hasn't been balanced internally." As he put it:

> SusTech went ass-backwards. I guess I can say that – it's a technical term… Instead of hiring techs, building technology, growing from that, it went straight to marketing, and sold a vision… It helped the company be famous in many ways, but there's a balance, and we didn't react fast enough to the balance.

Another executive echoed, “One of the things the company has generally struggled with for a while has been talking about itself and how fantastic it is, rather than focusing on what we are going to do – and just doing it.”

Overconfidence

Psychology research has indicated that an individual’s perceived ability to influence an environment can engender an illusion of control and overconfidence, and that both can lead to over-estimations of success and the rejection of negative information (Langer, 1975; Schwenk, 1984; Bourgeois, 1985; Hayward and Hambrick, 1997; Durand, 2003). The certainty and frequent dissemination of its story made SusTech’s development of the smart cities industry seem inevitable to stakeholders, something institutional scholars have described as critical in building legitimacy (e.g. Aldrich and Fiol, 1994). It also led executives and employees to become convinced of SusTech’s ability to influence the industry, despite problems the company occasionally faced. Overconfidence led employees not to reflect much on information or feedback from their environment. The perceived inevitability of the firm’s success was evident in this interview exchange with an executive:

> Executive: This doesn't happen overnight, but ultimately we’re going to make such huge savings in reducing waste and being able to trim down the amount of specialist areas that we need… Development is going to be cheaper and so much more efficient…. Maintenance is going to be cheaper and more efficient. It’s all obvious stuff, really. We’ll get there. We’ll get there in the end.
> Researcher: So you’re optimistic?
> Executive: Oh, *yeah*….I think you’ll see, in 12 months’ time, we’re going to change the face of the way people think about this stuff.

Certainty about its pivotal role in developing the future of the smart cities industry gave rise to feelings of control and confidence (Langer, 1975). Even during difficult times, employees and executives remained convinced of their ability to grow the firm and shape the smart cities industry. In 2011, the firm had failed to raise sufficient funds, and many employees had not been paid. Asked about this

challenge, and how the firm intended to secure financing, an executive stated:

> Well, I guess if [we] really knew the answer to that question right now, we'd all be feeling a little bit more comfortable. But the one thing we're convinced of is that it will flow and when it does it will be great.

As a result, employees and executives began to dismiss negative feedback as a lack of understanding on the part of the critic of the smart cities industry. Even when negative feedback and information was noticed, executives did not appear to reflect on it. During a company meeting, for instance, SusTech's Chairman told executives that financing was difficult to come by not because of SusTech's shortcomings, but because "sometimes the scale of project scares people." Rather than working to incorporate and address feedback by adapting their models, executives and employees typically responded by reasoning that they needed to work harder to prove their concept; that is, to intensify the focus on legitimation. For instance, a SusTech manager explained her experience presenting SusTech City to a bank:

> They told me, this is absolutely impossible. There is no project in the world that can grow so fast, that can reach that size… Of course, at the time I was so convinced that my reaction was that I will work twice as much to prove them wrong… They *must* be wrong. We are so new that they just don't understand.

Similarly, a potential hire, an expert from the real-estate industry, told SusTech's executives over breakfast in 2010 that SusTech City was not viable from a real-estate perspective. Reflecting on this statement, an executive told the others the problem was "a cultural issue" because the potential hire came from the real-estate industry could not appreciate the company's proposition. "How can we help her understand?" he mused.

The overconfidence inspired by SusTech's legitimation activities – and particularly the company's emphasis on the inevitability of its success in shaping the smart cities environment – meant employees and executives failed to process negative feedback. In 2012, a board member reflected that this inattention to feedback was the result of SusTech's legitimation, and that the company's future

success depended on reflecting on feedback:

> What will be key going forward is out ability to listen. When engaging with some big companies, it's taken a while to remove a bit of arrogance. It's like kids. It's quite charming when a 3-year old says, I wanna do this, I want it, I want it. When they're still saying it and they're 18, there's a problem…. We've often gone into broadcast mode and said, this is my vision, this is how we should be doing stuff. Sometimes it's quite good to listen to others.

Identity Commitments

Finally, institutional scholars have argued that legitimation requires commitment to a consistent story (Aldrich and Fiol, 1994). However, research on the psychology of self-perception suggests that public commitments shape an individual's identity and sense of self (Bem, 1967). Individuals who commit to and publicly defend even a randomly chosen position begin to internalize it, making it part of their beliefs and identity (Cialdini, 2001). Identity constrains action, because leaders and managers are often unwilling to pursue courses of action not aligned with their perceived identity (Tripsas and Gavetti, 2000; Tripsas, 2009). In fact, prior work on firms in nascent markets indicates that identity can constrain a firm's ability to shift its strategy (Khessina and Carroll, 2008). We take this research a step further by showing how legitimation activities, through the public commitments they require, can constrain and shape firm identity, limiting its ability to respond to new information.

Our research revealed that legitimation activities led SusTech to form what we term identity commitments. Because they committed to particular courses of action privately and publically, SusTech members began to internalize these commitments as the firm's identity. These commitments constrained their ability to respond to new information. Even when feedback was discussed, SusTech was often unable to change its actions.

Specifically, SusTech's story emphasized the importance of its reference project, SusTech City. SusTech City is our "critical project," Natley told us as early as 2009. "It's our attempt to demonstrate an example of what is possible in controlled conditions…and completely optimal circumstances." SusTech executives committed publicly to SusTech City in press events and partnership pitches; the project

featured prominently in the company's story, and was widely reported in media coverage of the smart cities industry. An employee, for instance, remarked on the great "pride" she felt when reading about SusTech City as a leading example of a smart cities initiative in the press.

As a result, employees and executives began to view the company's identity – and even their own identities – as inextricably linked to the development of the city. "Our goal," an employee told us in 2011, "is to completely change the way cities are built and made." SusTech City, he continued, can "change the way we think about cities." An executive explained what excited her about SusTech City: "Usually people who create legacies don't get to see them. We could see this happen in a few years." In response to a question on what excited him most about working for the company, an employee stated: "SusTech City. The richness of it. There are so many facets to it, everything from the technology to the socio-economic aspects, economic development, anthropology." Another explained the importance he attributed to the City project in personal terms: "I have three boys. I want them to be proud. I want them to feel that I've left something for this new generation."

These identity commitments led executives and employees to reject courses of action that compromised SusTech City. Beginning in early 2010, executives and employees began receiving feedback that the development of SusTech City was unlikely, including from banks and real-estate experts, as described above. However, most rejected the idea of abandoning SusTech City at the expense of other, potentially more realistic and profitable, opportunities. Speaking to employees about a new opportunity the company could pursue during an operations meeting in 2010, Natley emphasized that "we have to be careful not to get de-railed while still working on delivering SusTech City." Although SusTech began to emphasize technology development near the end of our data collection, informants noted that its response was slow; executives began to acknowledge the difficulty of developing SusTech City with a significant lag, only in mid-2011. Even then, they hesitated to abandon plans for SusTech City in favor of technological development, noting only that the time-line for the City might not be as

ambitious as they had previously imagined. In mid-2011, an executive told us:

> Trying to be realistic, I would say [sighs] – the market has moved. The ability to get a hold of the money [for a large-scale project] is really the limiting factor at the moment… If what I'm hearing is correct, it's likely that by – I'm going to say Christmas – we could start developing the project.

Even as the project's success became increasingly questionable, employees continued to defend it. In an interview in 2012, an executive stated:

> We are seeing the time-line for SusTech City slip… It might get started a year or two from today. We would like to break ground this year, but we're probably looking at next year. It's not dependent on us. It's more dependent on…economic problems in region. We need to be realistic about the opportunity. Having said that, we are not going to stop fighting for it.…It makes all the sense in the world.

By the end of data collection in late 2012, Natley emphasized in an operations meeting that the firm was pursuing other opportunities to embed its technology – but that the development of SusTech City remained important.

Natley and other executives acknowledged that this emphasis was due to the identity commitments executives and employees had formed around the project. "This project is larger than us at this point," Natley stated in response to a question on whether the company might dedicate its resources to the development of other opportunities rather than SusTech City. A late hire, an engineer focused on developing SusTech's technology, explained that although he felt the firm had possibilities to apply its technologies beyond SusTech City, many others did not feel that way. "There's definitely fall-back points for technology. For people's aspirations, maybe not."

3.4.4 Impact of Cognitive Effects on Organizational Learning

Our analysis suggests that these three cognitive effects constricted SusTech's ability to learn. Excessive attention to legitimation limited employees' time and capacity to develop new knowledge by testing their internal models and technologies. Overconfidence led executives and employees to ignore

or reject rather than reflect on negative feedback. Even when it became clear that their courses of action were suboptimal, the firm's identity commitments resulted in an inability to shift away from them.

In the future, quantitative research can attempt to control for potential reverse causality in our data. It is possible, for instance, that SusTech leaders and employees were highly confident in and committed to their idea, and that confidence and identity commitments drove external legitimation efforts, rather than vice-versa. However, the longitudinal nature of our data allowed us to account for this possibility, as we noted the early and extensive engagement in legitimation activities, and tracked the development of overconfidence and identity commitments over time.

First, legitimation, and particularly the dissemination and apparent acceptance of SusTech's story, seemed to lead to overconfidence. For instance, reflecting on a large and well-publicized partner event aimed at legitimating the company, an executive told us: "A new wave happened after the event for me." The event demonstrated support for the project and thus, "for me, there is no more risk. The risk is our own capacity to work towards what we want in the future. I saw that the world needs this; it's not a choice, but an obligation." His statement also captures how overconfidence, in turn, led to rejection of negative feedback: "I had been motivated by skeptics before: showing them we could do it. After that, I became motivated only by the people who believe in me. I have no more need for people who don't believe in me."

Similarly, over time, legitimation appeared to lead to identity commitments. Natley, for instance, explained how his public legitimation activities constrained the company's identity and thus its ability to abandon chosen courses of action. When asked whether he would consider developing other opportunities before SusTech City, Natley responded: "It wouldn't be worth it to us. It would be too damaging to our brand…. The problem would be abandoning some people and emotional commitments – so wouldn't be able to do it."

Shortly before leaving the firm, SusTech's COO reflected that perhaps the key to success in a nascent industry is attention to both legitimation and learning:

> I met a company the other day…. They've been around for 20 years. They have zero partnerships with any vendor…they're barely profitable, they've almost gone bankrupt a few times…because they never spent enough time convincing people that this is the right way to go forward. They never tried to do the marketing aspect. [Pause]. Maybe there's a middle ground.

3.5 Discussion

Leaders and entrepreneurs in nascent industries play a vital role in shaping the future. The activities of such pioneers can influence the industry for years into the future: their successes become models to emulate; their failures tripwires to avoid. Yet it is rare that researchers spend time in such firms to observe how they navigate the ambiguous context they necessarily inhabit. By studying the detailed activities of one new firm in a nascent industry, we identify a tension between legitimacy-seeking and organizational learning, both of which may be vital to the success of a firm in a nascent industry. A single case study presents limitations, but is useful for generating new theory. Although future research is needed to further develop and test our ideas, several contributions of our study warrant discussion.

The most important contribution is the illumination of cognitive mechanisms through which a firm's legitimation activities can inhibit its ability to learn. Prior studies have illustrated activities that firms and leaders can undertake in service of legitimation – including the crafting of stories that balance uniqueness and embeddedness in existing models (Hargadon and Douglas, 2001; Lounsbury and Glynn, 2001; Martens et al., 2007; Wry et al., 2011), the use of analogies and metaphors (Hill and Levenhagen, 1995; Cornelissen and Clarke, 2010), press and media attention (Rindova et al., 2007; Kennedy, 2008), and affiliating with prominent third parties (Stuart et al., 1999; Khaire, 2009). Other work emphasizes that developing viable businesses depends on learning, experimentation, and iteration, through fast

responses to feedback from the environment (e.g. Brown and Eisenhardt, 1997; Rindova and Kotha, 2001; Edmondson, 2011). Combining these perspectives, we suggest that a company's legitimation activities can inhibit its ability to learn, because of three related cognitive effects: constrained attention, overconfidence, and identity commitments. It is likely that our methodological choice enabled us to observe factors that have been missed in prior research. Most studies on a firm's legitimacy efforts have focused on external perceptions of the firm and have treated legitimation as a desirable outcome (e.g. Navis and Glynn, 2010). Studies on new firms in nascent industries have rarely explored the grounded processes that unfold within firms (e.g. Dobrev and Gostoupulos, 2010).

3.5.1 The Tension between Legitimacy and Learning

Awareness of these mechanisms can help generate new theory about how to successfully grow new firms in nascent industries. If legitimacy activities can adversely affect a new firm's internal development, handicapping first entrants in nascent industries (Dobrev and Gostopoulis, 2010), it is important to identify factors that ameliorate this risk, so that some new firms can be transformative vehicles driving the development of new industries. Could new firms in nascent industries simply ignore legitimation? The SusTech case suggests otherwise: the firm's efforts at legitimating its firm and industry led to tangible gains, including the attraction of resources, employees, and partners. Success in a nascent industry therefore may depend on balancing legitimation and learning. However, finding that balance is likely to be difficult, as SusTech's journey indicates. Legitimation activities can lead to tangible rewards: glowing press reports; motivated employees; supportive partners. In contrast, the effects of learning – or failing to learn – are less immediate, and accrue over time. Like SusTech leaders, entrepreneurs in nascent industries might be tempted to escalate their legitimation efforts in pursuit of tangible, immediate rewards; they may not notice the negative effects of these activities until they have manifested as cognitive rigidities.

3.5.2 Implications for Practice

By illuminating effects of attentional constraints, overconfidence, and identity commitments, our study gives rise to three recommendations that may help prevent these rigidities. First, to avoid the negative effects of constrained attention, entrepreneurial firms in nascent industries may need to invest in two types of organizational capabilities, perhaps led by different individuals: one focused on and skilled in external activities, the other focused on and skilled in internal activities. One could attempt to develop and disseminate a legitimating story; the other to build new knowledge through rapid testing of models and technologies. Seminal work on innovation suggests that successful organizations divide distinct activities in separate but coordinated centers focused on, for instance, exploration versus exploitation (March, 1991), or for sustaining versus disruptive innovations (Christensen and Raynor, 2003). Our research suggests that entrepreneurs in nascent industries may need to engage different people to legitimate their firms and industries, and to build new knowledge through prototyping and testing models and technologies. Research on founding teams has indicated that new firms benefit from a balance of individuals with different skills and capabilities (e.g. Beckman and Burton, 2008). Our work suggests balance in a nascent industry means something fundamentally different; entrepreneurs in this context should balance visionaries focused on legitimating with pragmatists focused on testing and building knowledge about the industry.

Second, to avoid the negative effects of overconfidence, leaders and entrepreneurs may need to distinguish between their external and internal story; internally, they may need to consciously manage the expectations generated by their external pronouncements. All organizations have multiple, distinct groups of stakeholders, and must sometimes decouple the way they frame their activities to each (Westphal and Zajac, 1998; Fiss and Zajac, 2006). Our research suggests entrepreneurs in nascent industries should take care to decouple their external story from their internal statements. Externally, they should focus on disseminating a symbolic story that emphasizes the firm's ability to create and

revolutionize a new industry; internally, they should temper overconfidence explicitly by emphasizing the challenges that lie ahead, inviting dissent, and building a psychologically safe climate where executives and employees are able to reflect on and question the firm's activities (Edmondson, 1999).

The third consequence of legitimation – identity commitments – is perhaps the most difficult to manage. This challenge speaks to a fundamental strategic trade-off firms must make: the choice between committing to particular courses of action so as to shape the environment (e.g. Ghemawat, 1991) and nurturing the ability to dynamically respond to changes in the environment (e.g. Brown and Eisenhardt, 1997). Our research suggests that this trade-off is particularly salient in the ambiguous environment of a nascent industry, where leaders must both commit to a symbolic story that legitimates the firm and industry and also adapt quickly based on new knowledge, given the lack of templates for action, the paucity of knowledge on customers, suppliers, and competitors, and the rapid shifts inherent in a nascent setting (Aldrich and Ruef, 2006; Gavetti and Rivkin, 2007). In light of this tension, entrepreneurs should consider the inhibiting possibilities of their commitments. They may wish, for instance, to commit to stories that emphasize a breadth of activities rather than the pursuit of specific activities. For instance, part of Yahoo!'s early success in the nascent internet portal industry owed much to its representation as a media company rather than an internet portal; this broad representation allowed it to adapt and pivot in response to new information (Gavetti and Rivkin, 2007). Staying broad – or at least attending to the limiting effects of a firm's identity commitments – might help entrepreneurs manage the tension between legitimation and learning.

3.5.3 Boundary Conditions

Our study gives rise to two questions about boundary conditions. First, we argue that the dynamics we observe are especially important for new firms. Established firms entering nascent industries might not need to pursue legitimation as vehemently as firms that lack established

reputations, existing customers, and sympathetic stakeholders. Even if they do, most will enter the industry with robust routines for building, reflecting on, and attending to new information; these activities are less likely to be disrupted through legitimation activities. Nonetheless, although our focus in this chapter is on a new firm, we believe the cognitive mechanisms we identified might play a role in other settings. Our findings thus call for further research that treats legitimation as an independent rather than a dependent variable by exploring the consequences of legitimation activities for internal development in other settings.

Second, we argue that the tension between legitimation and learning is especially salient in a nascent industry. It is possible to imagine, however, that the dynamics we identify are simply the result of an over-emphasis on marketing, to the detriment of internal operations. Perhaps SusTech was simply a firm that privileged marketing over operations, when success requires a sensible balance between the two. But the ambiguity inherent in a nascent context – its lack of legitimacy, its frequent shifts and lack of templates – means both legitimation and learning are necessary tasks, above and beyond typical attempts at marketing or internal development. Entrepreneurs in nascent industries truly need to invest significantly into developing both.

On the one hand, leaders who invest only in internal development, ignoring legitimacy, may develop technologies that, although financially and technologically plausible, are not perceived by the public as desirable. For instance, a number of companies developed solar hot water heaters in the early 1930s, but their products lost a battle to gas heaters because they were not explained as embedded in existing systems, nor were they defended with a grand vision (Madrigal, 2010). This small failure helped produce a large failure – the stunting of the development of a viable solar energy industry for decades (Madrigal, 2010).

On the other hand, history is sprinkled with thinkers who invested in building and promoting a vision for their firms and new industries but who could not sustain viable enterprises, such that the

world failed to gain fully from their powerful insights. Buckminster Fuller, the futurist designer and inventor, provides an apt example. Writing and speaking as early as the 1930s about energy efficient, affordable, and sustainable solutions for construction and housing, his attempts to industrialize fell short (Fuller, 1938; Bergdoll and Christensen, 2008). More than half a century would pass before similar thinking would take shape again in the popular imagination, led by more established enterprises (Bergdoll and Christensen, 2008).

3.6 Conclusion

We conceptualize entrepreneurship in nascent industries as comprising two interconnected, simultaneous journeys: a quest for legitimation and a quest for learning. Entrepreneurs in nascent industries must pursue both tasks simultaneously; yet their cognitive interactions ensure that the challenge of pursuing both is greater than the sum of its parts. Moreover, entrepreneurs might face an escalating temptation to over-invest in legitimation. Our research suggests that leaders who take steps to encourage and promote a new industry should also focus sufficiently on learning, and should be attuned to the cognitive consequences of legitimation. By elucidating the mechanisms that connect the two, we begin to suggest processes and interventions that can allow leaders to manage both tasks. If they are successful, their firms can give birth to the industries of the future. We hope that our findings inform future studies and theories to benefit entrepreneurs, firms, and the development of nascent industries.

CHAPTER FOUR

SHAPING AND EXPERIMENTING IN A NASCENT INDUSTRY

4.1 Introduction

Entrepreneurs founding firms in a nascent industry face a radically different competitive landscape than those in a mature industry (Aldrich and Fiol, 1994; Aldrich and Ruef, 2006; Santos and Eisenhardt, 2009). They must navigate an ambiguous market characterized by diverse products, fleeting producers, and skeptical stakeholders. They must develop effective firms without the benefit of established templates or proven paths to success. Our understanding of entrepreneurial action in the earliest stages of an industry' development is, however, limited.

In some instances, a new firm helps give rise to a new industry; the firm and the industry thus take shape together. A number of scholars have argued that successful firms in nascent industries engage in symbolic and substantive activities to help create the industry by establishing boundaries, defining categories, helping craft a collective identity, and building legitimacy (Aldrich and Fiol, 1994; Santos and Eisenhardt, 2009; Navis and Glynn, 2010; Wry et al., 2011). In this view, by actively *shaping* their environments, entrepreneurs can enact successful nascent industries (Navis and Glynn, 2010), and build competitive advantage for their own firms (Santos and Eisenhardt, 2009). At the same time, research in both nascent and mature industries has shown that the most effective new firms test different value propositions and business models, then morph and adapt based on feedback from the environment (Brown and Eisenhardt, 1997; Bhide, 2000; Rindova and Kotha, 2001). In this view, to succeed, entrepreneurs in nascent industries should engage in symbolic and substantive activities to *experiment* with their models.

Two notable gaps remain. First, existing literature has not explored whether and how firms in a nascent industry can shape and experiment at the same time. Yet tension between the two is likely. Akin

to exploration and exploitation in established firms (March, 1991), shaping and experimenting might call for different entrepreneurial capabilities, assumptions, and approaches to the external environment. Yet the literature suggests shaping and experimenting are two essential sets of activities, with little articulation of how they might interact. Second, studies of entrepreneurship in nascent industries have largely focused on firm-level activities, avoiding explicit references to agency. Thus research has not explored the role of a founder or entrepreneur in driving shaping or experimenting.

In this paper, we address these issues by exploring the activities entrepreneurs undertake when building a new firm in a nascent industry. We analyze the entire history of four new firms in the nascent *air taxi* market. We discovered that founders fell into two general categories: those with *visionary mindsets*, who saw themselves as pioneers and sought to create a new market, and those with *opportunist mindsets*, who sought to exploit an opportunity created by the development of new technologies. Entrepreneurial actions directed towards constructing meaning, making economic commitments, and adapting beliefs varied significantly, depending on the founders' mindsets: while firms launched by visionary founders focused on shaping, those launched by opportunist founders engaged in experimenting.

Although much of the literature emphasizes the benefits of shaping a nascent market (e.g. Santos and Eisendardt, 2009; Navis and Glynn, 2010), we found that engaging in shaping activities had unexpected negative consequences. Symbolic investments in constructing meaning for the industry, economic commitments to the founder's industry vision, and the persistence of early beliefs constrained firms' ability to experiment and adapt. We thus propose that the fate of firms with visionary founders will have a high variance compared to the fate of firms with opportunistic founders. If a founder's vision comes to fruition, the firm can be a "home run" that comes to epitomize a new industry. However, since investment into shaping can leave the firms unable to adapt to or experiment in their highly ambiguous, rapidly shifting contexts, the probability of failure is also higher. In contrast, firms with opportunistic

founders that focus on constructing meaning for their firms, make limited economic commitments to particular industry models, and experiment *before* attempting to shape a market, will have a lower risk of failure. We discuss the implications of this research for literature and entrepreneurship in nascent industries.

4.1.1 Theoretical Overview

A nascent industry's lack of natural history, and low but rapidly changing number of entrants, present entrepreneurs with unique challenges. First, in a nascent industry, categories are ambiguous (Rosa et al., 1999; Kennedy, 2008). Because their products and services are so new, and because entrants are frequently shifting, the firms within a nascent industry lack a collective identity (Navis and Glynn, 2010; Wry et al., 2011): common ideas about the central, distinctive, and enduring attributes that they share (Albert and Whetten, 1985). This is problematic because a shared, collective identity makes organizations more understandable to external audiences (Navis and Glynn, 2010; Wry et al., 2011). For instance, audiences are much more likely to understand the category of minivans if multiple minivan producers – Ford, GM, Honda – develop shared ideas about what a minivan is, and if these ideas guide similar products (Rosa et al., 1999). Moreover, once a collective identity exits, firms can begin claiming their own, individual identities based on "optimal distinctiveness" (Brewer, 1991): they can theorize their value by emphasizing both their links to and differences from others in the category (Navis and Glynn, 2011). By deviating slightly from their shared ideas, minivan producers can distinguish themselves as offering, for instance, the fastest, safest, or most economical models (Rosa et al., 1999).

Ambiguous categories can intensify another challenge: a nascent industry's lack of legitimacy. The industry's brief or non-existent history means customers and stakeholders do not take its existence, viability, and desirability for granted (Aldrich and Fiol, 1994; Suchman, 1995). Customers and stakeholders lack understanding of the potential of the products and services firms in the industry offer

(Aldrich and Fiol, 1994; Dobrev and Gotsopoulos, 2010). In the best cases, they might be unaware of the industry's existence; in the most extreme cases, they might question whether its products and services are needed, appropriate, or even moral. Entrepreneurs in nascent industries from biotechnology (Kaplan and Murray, 2010) to wind energy (Sine and Lee, 2009) have confronted this lack of legitimacy; the biotechnology and wind energy industries could only begin to develop once stakeholders had begun to accept the contested idea that they were desirable and proper.

At the same time, in a nascent industry, effective strategic paths and business models are elusive. Because there are no established competitors, firms lack accepted templates and stabilized paradigms about the best ways to compete (Santos and Eisenhardt, 2009). There are no proven customers with well-understood preferences; suppliers and partners are unclear and often changing (Rindova and Fombrun, 2001; Santos and Eisenhardt, 2009). Nobody knows what technologies will prove the most effective, or what products and price points will resonate with consumers; in fact, entrepreneurs lack a clear conception of who, precisely, their consumers will be (Benner and Tirpsas, 2012). They must therefore enact untested models about how, and for whom, to deliver value (Kaplan and Tripsas, 2008; Benner and Tripsas, 2012; McDonald and Eisenhardt, 2013).

All of these problems are compounded by the rapid shifts a nascent industry can take (Santos and Eisenhardt, 2009). The categories consumers respond to can change in surprising ways (Rosa et al., 1999). Because competitors, suppliers, partners, and products enter and exit rapidly, entrepreneurs may have to adapt to unexpected disruptions in their value chains (Santos and Eisenhardt, 2009). To cope with these shifts, entrepreneurs might need to remain flexible, and to continually probe their environments to learn about what works well or less well.

Most scholars writing about firms in nascent industries have explored how entrepreneurs respond to the first two challenges: a nascent industry's lack of stable categories and legitimacy. Successful entrepreneurs, in this view, engage in both symbolic and substantive activities to shape an

industry by crafting a collective identity and building legitimacy (Aldrich and Fiol, 1994; Navis and Glynn, 2010; Wry et al., 2011; David et al., 2012). Symbolically, they develop stories that elucidate a coherent vision of the industry (Navis and Glynn, 2010; Wry et al., 2011). By disseminating these stories through press releases, media coverage, and public events, they build a collective identity and legitimacy for the industry (Wry et al., 2011; Khaire, 2013). Substantively, they form affiliations and undertake collective activities (including associations that set common guidelines and practices) that help stabilize the industry's boundaries, raise awareness of practices, and thus solidify legitimacy (Santos and Eisenhardt, 2009; David et al., 2012).

Entrepreneurs enact these shaping activities to both create the industry and gain competitive advantage for their firms. On the one hand, Navis and Glynn (2010) showed how Sirius and XM engaged in shaping activities to build the satellite ratio industry. The firms initially engaged in symbolic activities to foster a collective identity and build legitimacy for the industry as a whole; once the industry had stabilized, they began to differentiate themselves from one another. On the other hand, in their study of five firms in different nascent internet markets, Santos and Eisenhardt (2009) showed how entrepreneurs' shaping activities helped build competitive advantage for their firms. The most successful firms were those that attempted to become a "cognitive referent" by defining a market's boundaries in their favor. These findings suggest that, by engaging in shaping activities to define the industry, build a collective identity, and increase legitimacy, entrepreneurs can benefit both their industries and their firms.

Less well-understood is whether and how entrepreneurs confront the third and fourth challenge of nascent industries: a lack of proven models or paths to success, and frequent industry shifts. Gavetti and Rivkin's (2007) study of firms in the nascent internet portal industry showed that, because customers, technologies, and business models are undefined, firms in nascent industries discover effective models through experimentation and adaptation. McDonald and Eisenhardt's (2013) study of

the nascent on-line investment market suggested that successful entrepreneurs test their business model assumptions early and frequently, and adopt flexible activity systems that can change in response to new, unanticipated industry changes. These findings suggest that, to thrive in a nascent industry, entrepreneurs should experiment with and shift their models in response to their environment. This idea is supported by research in mature industries, which has shown that successful entrepreneurs test different models in continuous learning loops (Brown and Eisenhardt, 1997; Bhide, 2000; Rindova and Kotha, 2001).

Existing literature has not explored whether and how entrepreneurs in a nascent industry engage in both sets of activities – those aimed at shaping an industry; those aimed at experimenting with their models – at the same time. Perhaps because most research on entrepreneurs in nascent industries has come out of a particular theoretical perspective, scholars have only focused on a subset of entrepreneurial activities: scholars studying institutionalism and symbolic entrepreneurship have focused on shaping (e.g. Navis and Glynn, 2010); scholars studying strategy on business model formation and change (e.g. McDonald and Eisenhardt, 2013). Each set has described shaping and experimenting as essential activities, with scant reference to how they might interact, and little attention to the role of a founder or entrepreneur in driving them.

We thus approach entrepreneurship in nascent industries as a distinctive field, informed by prior research in both institutionalist theory and strategy. We examine the entire set of activity systems new firms in a nascent industry pursue – with constant sensitivity to their potential interactions – in order to answer three related questions. First, what activities do entrepreneurs pursue when building a new firm in a nascent industry? Second, what is the role of the founder and entrepreneur in driving these activities? And finally, how do these activities impact the firm's success and survival?

4.2 Method

We explore these questions through a multi-case, inductive study of four new firms in a nascent industry. Our research design allowed us to examine firm activities in an in-depth, grounded way: we explored their causes, interactions, and consequences both qualitatively and quantitatively, and in great detail. At the same time, exploring multiple cases allowed for a "replication logic" (Eisenhardt and Graebner, 2007): by comparing and contrasting activities, causes, interactions, and consequences across cases, we were able to build confidence in our emerging conceptual insights. Nevertheless, the purpose of inductive research like this is to generate rather than test theory (Edmondson and McManus, 2007). The relationships and insights we illuminate should be treated as tentative, and can be refined and tested in future research on a larger sample of firms.

4.2.1 Research Setting: The Air Taxi Industry

Our setting is the air taxi market, which began to emerge in the early 2000s. The idea behind most air taxi operators was to allow travelers frustrated with the rigidity of commercial air travel and the relative inefficiency of driving to fly privately at a fraction of the cost charged by traditional charter companies. This idea was sparked by the development of new Very Light Jets (VLJs) like the Eclipse 500, and single-piston, turboprop aircraft like the Cirrus SR-22; both incorporated improved engine technologies to cut the price of private jet travel in half (Tripsas, Chow, Prewett, and Yttre, 2009). The basic model of air taxi operators was to combine these aircraft with new route optimization systems to allow travelers to take advantage of the 5,400 smaller public-use airports around the country. Since around 98% of Americans lived within 20 minutes of a regional airport, early market entrants imagined consumers could 'flag' an air taxi with as little as two hours of lead time; the air taxi would meet them at a regional airport and take them to their destination, typically charging for only the miles, minutes, or

route traveled. As Tripsas et al. (2009) described, “the air taxi business was hailed as means for bringing private aviation to the masses” (1).

The air taxi market provides an ideal setting to study entrepreneurial activities in a nascent industry. Although a number of firms began offering air taxi services between 2004 and 2007, industry observers disagreed about the potential size and viability of the market: while some argued air taxis would radically change the airline industry, others believed the market would fizzle. Early entrepreneurs targeted dissimilar customers with diverse products, services, and pricing models; they described their firms and the air taxi market using different and sometimes incompatible terms (from air taxi carriers to on-demand operators). They also experienced different outcomes: while some operators entered bankruptcy beginning in 2007, others grew over time.

4.2.2 Sample

We used public sources to generate a list and short descriptions of all air taxi operators founded between 2004 until 2007. We then constructed a theoretical sample: for each of the two primary airplane technologies (VLJs and turboprops), we chose a successful and unsuccessful company. We thus narrowed our focus to four firms: DayJet (bankrupt VLJ operator), Linear Air (successful VLJ operator), SATSAir (bankrupt turboprop operator), and ImagineAir (successful turboprop operator).

We began our research with a broad focus, hoping to build new theory on entrepreneurial activities in a nascent industry (Edmondson and McManus, 2007). We thus focused on constructing a sample of firms with sufficient similarities to allow for meaningful comparison. All four were founded at approximately the same time, and relied on the same technologies. There were also important differences. In particular, their founders came from different industries, with varying levels of experience. DayJet was founded by a former technology entrepreneur; SATSAir by airline industry executives; Linear Air by a serial entrepreneur; ImagineAir by a group of college students. These

differences allowed us to implicitly control for the effects of founders' prior entrepreneurial or industry-relevant skills, capabilities, and networks, which cannot explain the firms' different outcomes.

4.2.3 Data Sources

We utilized a rich set of qualitative and quantitative data from multiple sources: websites, press releases, business publications, semi-structured interviews, and materials provided by informants. Table 4.1 summarizes the companies and our data sources. Using webarchive.org, we captured and analyzed monthly historical webpages for each firm over multiple years. We collected all press releases issued by and business articles written about the firms. We obtained internal documents, including early business plans, investor presentations, and financial summaries for three of the firms.

Table 4.1: Chapter 4 Companies and Data Sources

	DayJet	**Linear Air**	**SATSAir**	**ImagineAir**
Founding year	2002	2004	2004	2005
Year of first flight	2007	2004	2004	2007
Bankruptcy year	2008	N/A	2009	N/A
Aircraft	Eclipse 500	Eclipse 500	Cirrus SR-22	Cirrus SR-22
Founders	Software executive	Serial entrepreneur	Aviation executives	College undergraduates
Webpage capture	3 years, monthly	8 years, monthly	4 years, monthly	8 years, monthly
Press releases	34	50	20	29
Articles	92	90	7	15
Interviews	2 (1 founder, 1 executive)	6 (1 founder, 1 executive)	5 (2 founders, 1 executive)	3 (3 founders)
Internal company data	N/A	Business model plans (3 years), investor presentations.	Investor presentation, financial statements (2 years), flight operating figures (4 years)	Investment deck, search engine analytics (8 years)

We also conducted 16 semi-structured, tape-recorded and transcribed interviews with eight founders and executives. These interviews, which ranged from one to 2.5 hours, focused on each firm's progress over time. In the case of Linear Air, we interviewed participants as the company grew, beginning in 2007 and ending in 2013. In the case of the other companies, we interviewed participants in 2012 and 2013. Of course, the passage of time between our study and the events in question raises the possibility of retrospective bias (Golden, 1992). We mitigated against this bias by interviewing multiple participants about the same events, and following protocols that focused on relating objective events. We used these interviews primarily to triangulate the thousands of pages of secondary data gathered about each firm.

Finally, to gain insight into the air taxi market as a whole, we interviewed 18 stakeholders: two industry analysts, six executives at other air taxi operators, and ten executives at more traditional air charter companies.

4.2.4 Data Analysis

We iterated between data collection and analysis, and examined the data in a series of stages. Our focus on founding mindsets, shaping, and experimentation was not determined *a priori,* but rather emerged through our analysis. We began by exploring the data through open cycles of coding, where we generated categories based on constructs that emerged from the data. For instance, we developed a code of Founding Reasons, which captured entrepreneurs' statements about why they founded their firms (both in interviews and public sources); eventually, we began to conceptualize this as *founding mindset*. Table 4.2 summarizes the different founding mindsets we uncovered.

Table 4.2: Visionary vs. Opportunist Founding Mindsets

	Visionary Mindset	Opportunist Mindset
Reason for Launching Firm	To create a new market.	To exploit a new opportunity.
Belief about Air Taxis	New market.	Newly-enabled opportunity.

At the same time, we wrote detailed case histories for each firm that described its evolution and progress, including all business model changes, activities founders engaged in, and announced affiliations and partnerships.

As we compared the cases, we recognized that some entrepreneurs initially focused their activities on developing the air taxi market. For instance, they published press releases explaining their industry, and spoke at multiple inter-industry events. Other entrepreneurs focused on growing their firms: iterating and adapting their business models; promoting firm activities through press releases and interviews. We began to conceptualize these activities as *shaping* and *experimenting*. Moreover, we noted that these activities seemed to align with a founder's initial mindset – that is, reason for launching the firm.

In the next stage of analysis, we explored these two foci of attention more deeply, primarily using QSR NVivo, the qualitative data analysis software. To capture differences in websites and press releases, we coded the number and proportion of each that focused on explaining the industry versus the firm. We constructed histories of each firm's industry-oriented activities (for instance, participation in a panel on air taxis, engagement with an air taxi association, etc.), by searching both the firms' press releases and Factiva mentions. We gathered all founding stories written about each firm and coded their content, particularly whether they emphasized founders' shaping of the air taxi market, entrepreneurial experience, or firm-specific skills.

We searched press releases, interviews, and executive quotes in articles for any comparisons: that is, instances when a firm likened or differentiated itself from another company or market category

(by writing, for instance, “we are like a cheaper charter,” or “our technology makes us different than commercial airlines”). We coded the target market of these comparisons (for instance, commercial airlines and air charters), and whether they focused on similarities or differences.

We also coded each company’s corporate “about us,” nothing any references to: 1. The new air taxi market or established markets; 2. The firm’s creation of or leadership in the market; 3. The capabilities each firm possessed, whether related to market creation or firm leadership. We coded all changes in a firm’s “about us” over time. Appendix 4.1 provides examples of our coding scheme.

We also noted that while some firms formed strong economic commitments, including affiliations with partners and inter-industry associations, others did not. We searched press releases to construct histories of each company’s announced affiliations. We coded the target of the affiliation (for instance, a private company, a governmental body, an association), and whether the stated aim of the affiliation was creating the air taxi market or brining specific benefits to the company. Appendix 4.2 provides examples of our coding of affiliations.

Finally, we coded data from webpages and press releases to capture any changes in a firm’s business model (for instance, the addition of new aircraft, a change in pricing models, etc.). In our interviews, we asked founders to reflect on any changes their firms had made. We used this data to construct time-lines that captured all major changes in a firm’s business model.

When we completed this stage, we had constructed a list of activities that seemed to differ based on a founder’s mindset. In the next stage of analysis, we began to abstract from the data to cluster these activities into conceptual categories. This included iterating between the data and literature on entrepreneurship and nascent industries. We engaged in numerous discussions focused on the connections and interactions between activities. In a significant breakthrough, we recognized that these activities existed in distinct domains: some were symbolic (that is, comprising differences in statements and pronouncements in the media, public events, etc.); others were substantive (that is,

comprising differences in real commitments in the form of business model changes or the formation of alliances); the remainder were cognitive (that is, comprising differences in the ways founders and executives thought about their firms and industry). We thus clustered each of the activities we had identified into one of the three categories. We discussed the purpose of each activity in the category, and the way they fit together. In so doing, we recognized that some were mechanisms, while others were consequences. This stage of analysis led to the development of three theoretical categories – constructing meaning, committing to partners, and ossifying beliefs – and the consequences of each.

In the final stage of analysis, we connected our theoretical categories to a firm's success or failure, both by tracking causal pathways in our data, and by comparing our data with the literature on entrepreneurship and nascent industries. This resulted in a series of propositions about entrepreneurship in nascent industries.

4.3 Shaping and Experimenting in the Air Taxi Market

Our analysis revealed that the founders of the four firms we studied developed contrasting *founding mindsets.* These mindsets included founders' reasons for launching the firms and their beliefs about the air taxi market. DayJet and SATSAir's founders held visionary founding mindsets: they described how they formed their firms to revolutionize air travel by creating a new air taxi market. As a DayJet executive explained in an interview, the goal was "to really create a new market…. to create this new sector, this new way of traveling." In contrast, Linear Air and ImagineAir's founders held opportunist founding mindsets: they described how they formed their firms to exploit an opportunity enabled by the development of new, technologically-advanced aircraft. They thus focused their attention on growing a successful business: as an ImagineAir founder explained in an interview, "Of course I'd like to say I'm trying to start a new industry. That's the sexy answer. But is that the right

answer?.... Me, personally, I'm so internally driven that I'm the worst person in the world to do that…. I've been very internally focused on our business."

Our analysis indicated that founders enacted these mindsets through patterns of interrelated activities that we organize into three processes: 1. *Constructing meaning*, a symbolic process*;* 2. *Committing to partners*, a substantive process*;* 3. *Ossifying beliefs*, a cognitive process*.* Firms formed by visionary founders (which we term *visionary firms*): 1. Constructed meaning for the air taxi market as a whole by disseminating stories about the market, emphasizing its distinctiveness relative to other markets, and signaling the firm's leadership in creating the market; 2. Made strong economic commitments by establishing alliances and building inter-industry associations; 3. Through imprinting, developed ossified beliefs about the need for stability in their business models. In contrast, firms formed by opportunist founders (which we term *opportunist firms*): 1. Constructed meaning for the new firm by disseminating stories about the firm, emphasizing its similarity to existing markets, and signaling its leadership in competing in the air taxi market; 2. Made weak economic commitments by establishing partnerships and participating in inter-industry associations; 3. Through imprinting, developed ossified beliefs about the need for change in their business models.

Engaging in each process had unintentional consequences for visionary firms. Table 4.3 summarizes these processes and their consequences. By constructing meaning for the market, visionary firms restricted the ability to change their claims about their market category. By developing strong economic commitments, they blocked the ability to adapt to market shifts. By ossifying beliefs about business model stability, they failed to learn by experimenting with their business models. In a nascent industry, categories are unstable (Rosa et al., 1999), market shifts are rapid (Dobrev and Gotsopoulos 2010), and business models are unproven (McDonald and Eisenhardt, 2013); entrepreneurial firms are more likely to survive if they try out multiple claims to see what resonates with stakeholders, remain flexible in order to adapt to unexpected shifts, and learn through business model experiments

(McDonald and Eisenhardt, 2013). Our analysis suggests that, unexpectedly, founders' visionary mindset thus lowered their firms' probability of survival. Next, we describe the two mindsets, and then develop each process and its consequences in detail.

Table 4.3: Activities Associated with Visionary vs. Opportunist Founding Mindsets

Elements	Constructing Meaning	Committing to Partners	Ossifying Beliefs
Domain of Action	Symbolic.	Substantive.	Cognitive.
Mechanisms	Disseminating stories. Theorizing category comparisons. Signaling leadership.	Developing partnerships. Engaging with inter-industry associations.	Imprinting.
Visionary Mindset			
Objective	Build collective identity, awareness of, legitimacy for a new market and firm as creator of new market.	Create boundaries for a new market.	Develop stable business model to serve as basis for creating a market.
Unintentional consequence	Claims about the market category do not change.	Inability to adapt to market shifts.	Do not experiment with model.
Opportunist Mindset			
Objective	Build collective identity, awareness of, legitimacy for a new firm.	Create advantage for a firm in a new market.	Develop flexible business model to serve as basis for exploiting market opportunity.
Unintentional consequence	Claims about the market category change.	Ability to adapt to market shifts.	Experiment with model.

4.3.1 Visionary and Opportunist Mindsets

DayJet. DayJet was founded by an executive and entrepreneur with prior experience in the technology industry. After working for a number of well-known software companies, he founded, took public, and eventually sold his share of a high-growth software business. A frequent flier and owner of a private jet, he learned about the development of new VLJ aircraft – and particularly the Eclipse 500 – through his network of contacts. He decided to form a new air travel company that would couple VLJs with optimization software to, as he described, create a new market for on-demand, short-haul travel; industry analysts termed it the air taxi market.

DayJet's founder held a visionary mindset: he viewed air taxis as a new market, and described his firm as the creator of that market. In an interview with a business aviation journal written shortly after the DayJet's launch, he described how he formed the firm to "*pioneer a disruptive market* that will give consumers an on-demand air transportation alternative at a commercial scale." In a press release issued in early 2005, he further explained his visionary mindset:

> It's a rare privilege to be involved in the type of watershed change that *remodels an entire industry* and even *influences our way of life*…. I've been fortunate enough to work with several innovative teams at the right points in time to bring transformative products and services to market: having been deeply involved in the earliest days of the PC industry; having helped to create the Windows 'server-based' computing architecture that powers much of corporate America; and now, *in shaping the future of regional business travel* with 'Per-Seat, On-Demand' jet services. This is the most exciting business opportunity I've ever faced.

In an interview, a DayJet executive described the founder as a visionary creating a new market:

> He was very vocal, very public, a very charismatic speaker and a motivational individual, out there singing about the *new way of air travel* and the transformation that [his] technology [would bring] *to a new industry*. I think created excitement about this new way of traveling.

SATSAir. SATSAir was launched by a team of three founders, two with extensive experience in air travel. SATSAir's CEO –the founder described by the others as responsible for "developing a vision" for the company – was the head of engineering for a well-known aircraft manufacturer; another founder

owned an air charter company; the third developed route optimization software. In the early 2000s, the firm's CEO played a leading role in the SATS Program, a $150 million, five-year, public-private partnership between the Federal Aviation Administration (FAA), NASA, state and local aviation officials, and aviation companies that explored ways to make small aircraft and airports a viable element of the country's transportation network. In working on the project, the founder saw the potential to form a new company that would use small aircraft and secondary airports to, as he described, launch a new air taxi market; together with two contacts, he founded SATSAir.

SATSAir's founders held visionary mindsets: they viewed air taxis as a new market, and described the firm as the creator of that market. In an interview, the CEO explained that, because it was a new market, "it took that vision to make the air taxi concept work – and we had that." He elaborated:

> There was a clear pathway for us between the vision and the company. Others launching air taxis had heard some of the press, but weren't part of that thought process. *Our original idea was to get general aviation out of the 1930s*…. The industry had seen 80 years of a lack of progress. We knew general aviation was in a funk – and *we decided… to see how we could move things forward*.

Linear Air. Linear Air was founded by a serial entrepreneur and private pilot: an MBA who had launched a number of companies, including a start-up in the wine retailing industry and a 200-person e-mail marketing company. While heading the marketing company, he became frustrated with the inability of standard aviation options to meet his employees' needs. In an article, he explained:

> Companies … would frequently call and ask us to put a team… on a plane to, say, Cleveland "right now." So we'd hang up the phone, call our corporate travel agent and buy three coach tickets… and those might cost us $3000 and our people might not be able to get back the same day, which would add even more to the cost… So it was somewhere in that period that it occurred to me that *there was a big opportunity* in efficiently and economically connecting people who live and work near major metro areas with their business interests in secondary and tertiary markets.

As he read about the development of VLJs in industry publications, he recognized their potential to address these needs. Through a local entrepreneurs' network, he met the co-operator of a large flight training facility, and the two decided to launch an air taxi company.

Linear Air's founder held an opportunist mindset: he described how he formed his firm to exploit a potentially profitable opportunity created by the development of VLJs. While he believed that air taxi services were enabled by the development of new technology, he did not explicitly label them as a new market. In a presentation, he recalled:

> When I was leaving my last company, around Thanksgiving, 2003, I was having dinner with the folks. And they say, "What are you going to do next?" "Oh, I think I'm going to start an airline." And, you know, the silverware hits the floor and everybody gets quiet. And people have said to me, why would you want to do this? And, you know, the answer is that *the airline business can be a really great business*…. You can get a lot of operating leverage, and *it can become very profitable*.

He further explained how this opportunist mindset had guided all of his entrepreneurial efforts, including Linear Air: "I've bounced around through a lot of businesses. The one constant that I can draw through all of the businesses that I've been involved in is that *there's been some sort of new thing that's created a new business opportunity*."

ImagineAir. ImagineAir was founded by four recent college graduates: a group of friends with an interest in aviation. One of them studied aviation engineering; two were private pilots; one had some prior internship experience at major airlines. During their senior year in college, they had begun to talk about launching an aviation business together – they discussed, among other options, a flight school – when they learned about new VLJs and other technologically-advanced aircraft through industry publications. They decided to launch an air taxi company that would fly these aircraft in on-demand, short-haul trips.

ImagineAir's founders held opportunist mindsets: they formed the firm to exploit an exciting opportunity created by the development of VLJs. Like Linear Air's founder, they did not explicitly describe this opportunity as a new market. In an interview, one of ImagineAir's founders described the impetus for the company: "I was sitting around with a bunch of friends drinking beer, and *it just seemed like a good idea* at the time….. You know, I read all the magazines. I guess I stayed up to date, and

everybody--everybody was talking about [the new aircraft].” In an interview, another founder echoed: “There was a lot of buzz about this new micro jet that was going to change the world, and there were going to be so many of them flying, they were going to blot out the sun.” In an interview with a local newspaper, a third founder explained why he decided to pursue the opportunity: “I was still young and didn’t have much to lose…. So why not *go out there and take a chance*?”

4.3.2 Constructing Meaning

Entrepreneurs in any setting engage in symbolic activities that use institutional or cultural resources to construct meaning for their activities (Rindova et al., 2007). We found that new firms in nascent industries dedicate significant effort to constructing meaning through processes that we categorize as three distinctive mechanisms: *disseminating stories*, *theorizing category comparisons*, and *signaling leadership.* “Disseminating stories” involves spreading symbolic, cohesive narratives – including founding stories about the firm’s earliest years (Navis and Glynn, 2011) – through websites, press releases, media sources, and speaking engagements (Santos and Eisenhardt, 2009; Navis and Glynn, 2010; Khaire, 2013). “Theorizing category comparisons” involves comparing activities to other, established categories in an effort to make them more understandable and meaningful (Navis and Glynn, 2010; Wry et al., 2011). “Signaling leadership” involves conveying superior capabilities through press releases and public sources (Santos and Eisenhardt, 2009).

Our analysis revealed that, while visionary firms attempt to construct meaning for their nascent market as a whole, opportunist firms attempt to construct meaning for the firm itself. Visionary firms spread stories to define the air taxi market; they emphasize the distinctiveness of the market relative to other markets; and they signal the firm’s leadership in creating the market. Through these efforts, they aim to build a collective identity for, awareness of, and legitimacy for the new market (Navis and Glynn, 2010) and the firm as its creator and cognitive referent (Santos and Eisenhardt, 2009). In contrast,

opportunist firms spread stories to describe their firms; they emphasize linkages between their activities and other markets; and they signal the firm's leadership in competing in the market. Through these efforts, they aim to build an identity for, awareness of, and legitimacy for the firm itself. Table 4.4 summarizes these mechanisms.

Table 4.4: Constructing Meaning, 2004 – 2009

	Mechanisms		
	Disseminating Stories	**Theorizing Category Comparisons**	**Signaling Leadership**
Definition	Spread of symbolic narratives that define and explain the industry/firm.	Compare activities to other established categories.	Convey superior capabilities.
Visionary Mindset	Spread stories to describe the air taxi market.	Emphasize distinctiveness of air taxi market relative to other markets.	Signal firm leadership in creating the air taxi market.
Rationale	Create collective identity for and raise awareness of market.	Build legitimacy for the market.	Convey image of firm as cognitive referent and creator of market.
DayJet	Website described per-seat, on-demand service as a new market. Press releases explained need for market (focus groups, surveys, analyst quotes). High engagement in events focused on air taxi market. Founding stories focused on founder's attempt to create or disrupt a new market.	Press release "about us" described air taxis as a new market. Comparisons focused on distinctiveness of activities, especially from air charter model.	Press release "about us" emphasized how firm was creating new market. Press release "about us" highlighted capabilities and resources that enabled firm to create new market.
SATSAir	Website described air taxis as a new market. Medium engagement in events focused on air taxi market. Founding stories focused on founders' attempt to change aviation by creating a new market.	Press release "about us" described air taxis as a new market. Comparisons focused on distinctiveness of activities, especially from air charter model.	Press release "about us" emphasized how firm was creating new market. Press release "about us" highlighted capabilities and resources that enabled firm to create new market.
Opportunist Mindset	Spread stories to describe the firm.	Emphasize similarity between firm and other firms/markets.	Signal firm leadership in competing in the air taxi market.
Rationale	Reinforce identity of and raise awareness of firm.	Build legitimacy for the firm.	Convey image of firm as leader in market.
Linear Air	Website described potential of firm. Medium engagement in events focused on air taxi market. Founding stories focused on founder's entrepreneurial experience.	Press release "about us" emphasized existing markets. Comparisons focused on linkages between activities and existing templates, especially from air charter model.	Press release "about us" emphasized how firm was competing in market. Press release "about us" highlighted capabilities and resources that enabled firm to lead in market.
ImagineAir	Website described potential of firm. Infrequent engagement in events focused on air taxi market. Founding stories focused on founders' youth and open-mindedness.	Press release "about us" emphasized existing markets. Comparisons focused on linkages between activities and existing templates, especially from air charter model.	Press release "about us" emphasized how firm was competing in market. Press release "about us" highlighted capabilities and resources that enabled firm to lead in market.

Disseminating Stories

DayJet. DayJet's stories attempted to describe and shape an identity for the air taxi market. The firm's website explained the air taxi market and how it would revolutionize aviation: a page detailed the "New Option in Regional Business Travel" that DayJet had developed. Its earliest press releases described the need for and potential of the market as a whole. For instance, a 2005 press release reported on the results of a USA Today poll that demonstrated high demand for on-demand, short haul flights. Another 2005 press release consisted of analyst quotes; many emphasized the viability and growth of the air taxi market in general rather than DayJet in particular. For instance, an analyst was quoted as stating:

> Small communities have been neglected as major airlines concentrate resources on larger markets and larger, more profitable aircraft…. The exciting aspect of the combination of micro-jets and on-demand services, if priced competitively, is the vast number of airports and communities that can receive such modern, comfortable aircraft…. If it works, *it will be a revolution in air travel.*

DayJet's founder and executives frequently participated in high-visibility speaking engagements and forums; when they did so, they described the need for a new market that would radically improve travel by providing an alternative to commercial flights or charter airlines. For instance, in 2005, DayJet's founder participated in a government-sponsored SATS Conference. The firm's press release reported:

> Executives from DayJet Corporation, Eclipse Aviation and Pratt & Whitney Canada told attendees at the "SATS 2005: A Transformation in Air Travel" demonstration today that a favorable confluence of technology breakthroughs will *radically improve jet service* for travelers…. The panel, entitled "Enabling On-Demand Transportation" described in detail the progress being made on propulsion systems, airframes and scheduling/operations that are *rapidly creating a new industry of point-to-point jet travel, available on-demand.*

Finally, DayJet's founding story emphasized its founder's extensive experience disrupting and launching markets, commitment to the problems plaguing air travel, and vision for a new air taxi market. An article about the company, for instance, described how:

> Around the halls of DayJet, [he] is called "George"—as in *George Jetson*. [He], after all, wants to make the car-size jets imagined in the cartoon a reality, with an air-taxi service for short business trips that he's trying to launch next spring…. [He] sees a future in which people can hail one of his DayJets on short notice to go where and when they want, without the hassle of changing planes or navigating big hub airports.

DayJet's story also emphasized its early team's outsider experience: in interviews, the founder frequently mentioned the "Russian rocket scientists" who were working on the company's software. And article described how the founder:

> Put together a *crack team of multi-disciplinary experts* who, instead of concentrating on conventional aviation issues, were tasked with *building an entirely new paradigm*, one in which the only carry over from the traditional airline model would be safety and security issues. "We kept ourselves aligned with Rule 135 [federal regulations on non-scheduled airline services] and literally threw everything else out of the window to start afresh," [he said].

Together, these elements – a focus on change, problem-solving, an outside perspective – crafted a narrative about the firm as one capable of launching a disruptive, distinctive market. An article on the company quoted a business thought-leader who explained:

> Introducing an innovation such as this – one that would build to demand – must come from a CEO who has used emergent strategy processes to *create a new-market disruption* in another service business. It will require an outside perspective to *enact this type of disruptive innovation* in the aviation industry.

SATSAir. SATSAir, too, focused on disseminating stories about the air taxi market. Its website explained the idea behind the market: "SATSair is the first to offer this innovative new approach to air travel…. *The air taxi concept is simple*. We'll pick you up at the airport most convenient for you and take you where you want to go, when you want to go, at a cost you can afford." Its founders engaged in speaking engagements relatively frequently; when they did so, they focused on explaining the market. For instance, a 2005 SATSAir press release described how a founder spoke at an aviation expo, and "participated in a taped interview about the air taxi concept."

While DayJet's founding story was one of outsiders launching a disruptive new market, SATSAir crafted a narrative about air travel insiders who were able, through their deep experience, to recognize the potential for a new way of travel. The story emphasized founders' extensive air travel experience, focus on solving the problem of air travel, and their vision for the new air taxi market. For instance, an article described how:

> The name SATSair was inspired by the acronym for the Small Aircraft Transportation System, the program doggedly promoted by NASA to expand the nation's air transportation system to airports like 50J and to people who have never had access to affordable alternative air travel. Rejiggering the acronym, SATSAir says it stands for "Smart Air Travel Solutions." When [the founder], *a former airline executive*, was a *participant in the NASA Advanced General Aviation Transport Experiments (AGATE) and, later, SATS, he was intrigued by the whole notion of linking smaller communities with underutilized airports.*

Another article described how, because of its connection to the SATS vision, "the venture was about 17 years in the making." Together, these elements – a focus on expertise, problem-solving, deep thinking and tradition – crafted a narrative about the firm as one capable of enabling a new market and reshaping its industry. An article on the company quoted a founder who explained: "A lot gets touted in the media about so and so ordering 1,000 airplanes. I would rather see a headline that reads "*air taxi concept proven*, business continues to grow.""

Linear Air. Linear Air's stories, in contrast, focused on describing the firm. The company's website and press releases explained the firm's proposition rather than its market as a whole. While Linear Air's founder engaged in speaking engagements relatively frequently, when he did so, he focused on describing the firm as a market leader. A 2006 press release, for instance, reported how the founder would "participate in a panel discussion among aviation officials and other air-taxi industry leaders at the Flight School: Air conference." But the press release implied that the purpose of this engagement was distinguishing the firm: "Linear Air's participation in the conference is *directly related to the impact and success that the company has already experienced* while operating in the emerging jet-taxi space."

Linear Air's founding story focused on its founder's entrepreneurial experience and drive, the firm's business model, and its unique resources and capabilities. An article described how Linear Air was: "headed by 43-year-old e-commerce entrepreneur…. He now has 600 customers, using Cessna turboprop planes, and expects the number to rise to 5,000 when he offers jet service, charging less than existing charters." Another explained how the founder – "a former chief financial officer of a public company and a recreational pilot" – understood what it would take to launch a successful business:

> [He] knew the risks associated with buying planes -- expensive products that depreciate quickly. And he knew individuals would be more likely to take this kind of risk than most bankers, because banks prefer to lend to firms with a track record of success. Recent widespread troubles among traditional airlines have rendered bankers even more hesitant to finance a new kind of plane and a new kind of operation.

This knowledge, the article explained, helped him secure private financing to launch the company. Together, these elements – a focus on firm-specific knowledge and capabilities – crafted a narrative about the firm as one capable of competing and succeeding in the air taxi market.

ImagineAir. ImagineAir's stories were especially internally-focused. The firm's website and press releases focused exclusively on its own proposition and achievements; founders engaged in speaking events or forums infrequently. ImagineAir's founding story focused almost exclusively on founders' youth and open-mindedness. Founders were featured in a CNN article on "Young People Who Rock." Another article described how founders convinced an investor to fund the venture:

> The conversation turned to the discussion of starting an airline.... [The investor] bankrolled the airline and turned it over to [the founders]. "He wanted to put us in charge. He wanted to give us the opportunity because *he saw the value of taking kids right out of college with open minds* like himself," [a founder] said.

Together, these elements crafted a narrative that distinguished the firm as young, flexible, and thus capable of competing in the air taxi space. A founder explained how this narrative helped raise awareness of the firm: "We were fortunate. I mean, it was a pretty neat story: there's four guys, under their 30s, starting a private airline…. And we used that and it helped us to get press."

Theorizing Category Comparisons

DayJet and SATSAir. To explain and justify their ventures and propositions, entrepreneurs often theorize category comparisons: they draw on analogies and contrasts between their own activities and established firms or institutions in an effort to make them more understandable (Navis and Glynn, 2011). DayJet and SATSAir's category comparisons theorized the distinctiveness of the air taxi market relative to other markets. In press releases, each firm's "about us" defined air taxis as a new market. DayJet's early "about us" described the firm as:

> The *pioneer of a new type of regional travel:* "Per-Seat, On-Demand" jet service tailored to the passenger's individual schedule and priced only slightly higher than full-fare coach airfares. Headquartered in Delray Beach, Florida, DayJet has developed *this new industry's* first real-time operations system.

Similarly, SATSAir's early about us described the firm as: "The first to offer the *innovative "Air Taxi" concept*."

In media stories and press releases, founders emphasized how this market was distinctive from established categories like airlines and air charters. In an article, DayJet's founder described how his efforts are "a *vast departure* from what people have done in the past." He echoed this in an interview with a newspaper:

> *Aviation hasn't really changed much in 100 years, but DayJet will be completely different from the ground up*…. Everything will be digital, from workflow management to databases, everything will be scanned in and utilized in digital form. We're using embedded technology to build a service which literally could not exist without these sophisticated software systems.

In particular, by emphasizing the unique technologies and prices that would open their services to a new class of customers, founders attempted to distinguish air taxis as more than a subset of the better-known air charter market. When press releases or founder statements mentioned air charters, it was to emphasize how the air taxi proposition was different. In an article, DayJet's founder explained his vision of the distinction:

> *We don't see this as incremental, another form of charter*. We're going to take away from the drivers, not from people now flying…. The real test will be the customers. *If a year and a half from now, they're the same as those now using charters, then the model's a failure*.

In 2007, SATSAir began referring to itself as an air cab rather than air taxi operator; this change was an attempt to distinguish the two markets. In an article, a founder explained: "We don't call it an air taxi service because the FAA's [the Federal Aviation Administration, the US regulator] definition of air taxis includes charters. *We're not a charter operator – we only operate the air cab model*."

These comparisons were part of a deliberate effort to build understanding for the air taxi market as a whole. In an interview, one of SATSAir's founders explained: "We weren't as worried about differentiating ourselves other [air taxi companies]…. We were very careful in trying to emphasize the *difference between the air taxi and the air-charter industry*…. We were *constantly trying to separate the air taxi market*."

Linear Air and ImagineAir. Linear Air and ImagineAir's category comparisons, in contrast, theorized the linkages between each firm and existing templates. Their "about us" described each firm as operating in a known market. Linear Air's early "about us" described the company as: "a premier air-taxi service that is transforming the *private air travel industry*. With operations out of Hanscom Field in Bedford, Mass. near Boston, Linear Air provides *short-hop private air travel* at *airline rates*." ImagineAir's early "about us" described the company's commitment to making "*regional travel* easier, faster, and more comfortable than ever before."

In media stories and press releases, founders emphasized how their propositions and services were similar to established categories, and how the companies drew the best elements from airlines (including their prices) and air charters (including their convenience). Linear Air's press releases, for instance, described the firm as offering "*private air travel* at *airline prices."* Another press release quoted LinearAir's founder:

> Our goal from the start has been to create a business that would allow us to *bridge the gap between current regional business airline travel and private air travel*. The Eclipse 500 allows us to do exactly that by offering *private jet performance* at a *price that fits most corporate travel budgets*.

Similarly, an ImagineAir press release described how the company "provides regional travelers all the *benefits of personal air travel* at a *fraction of the cost of traditional charter aircraft*." Each firm deployed metaphors that further emphasized these linkages. "We're sort of the *Southwest Airlines* of the *NetJets space*. We're the lowest cost provider within the private or business air travel space," Linear Air's founder reflected in an interview. Describing the firm's pricing in an article, an ImagineAir founder stated: "With us, it's just one number, *like buying from Delta*."

These comparisons were part of a deliberate effort to build legitimacy for each firm by linking its activities to existing categories. In an interview, Linear Air's founder explained how comparing his services to charters allowed him to appeal to traditional charter customers, a proven group with well-understood preferences:

> We initially went after the people who would be the most likely customers, whole-plane charter users at the top of the bell curve. For them, we could give an experience that they were used to for 40% less than what they were used to paying. So that was the easiest group to go after.

In an interview, one of ImagineAir's founders explained how these linkages helped customers make sense of the new firm:

> For a customer, sometimes it was not clear what we are. We let them know that, "Hey! *We are something kind of like air charter*, except for where we offer pricing and we offer just one-way fares and it costs a lot less because we fit the niche of two, maybe three, people looking to replace a three to eight-hour drive."

Signaling Leadership

DayJet and SATSAir. Entrepreneurs also construct meaning for their activities by signaling leadership: they strategically deploy public statements to convey their superior capabilities (Santos and Eisenhardt, 2009). DayJet and SATSAir signaled their leadership in creating the air taxi market: that is,

they attempted to convey an image of themselves as the creators of and cognitive referents in the market. Their "about us" statements identified each firm as the creator of the air taxi market; they highlighted the unique capabilities and resources that allowed each firm to shape the market. DayJet's early "about us," recall, described the company as:

> The *pioneer of a new type of regional travel*: "Per-Seat, On-Demand" jet service…. DayJet has *developed this new industry's first real-time operations system*. Combined with the speed and efficiency of new-generation small jet aircraft, DayJet has *created the next major advance in regional business travel*.

DayJet, this statement signaled, was able to "pioneer" a "new industry" through its unique technology.

Similarly, SATSAir's early "about us" described it as: "The *first* to offer the *innovative "Air Taxi" concept* based on *extensive research and strategic relationships with agencies such as NASA and the FAA*." SATSAir, these statements signaled, was able to create the air taxi market through its research and relationships.

Linear Air and ImagineAir. In contrast, Linear Air and ImagineAir signaled their leadership in competing in the air taxi market: that is, they attempted to convey images of themselves as viable players in the market. Their "about us" statements identified each firm as participating in rather than creating the air taxi market; they highlighted the unique capabilities and resources that allowed each firm to gain competitive advantage. Linear Air's earliest press releases described the firm as:

> A *premier* air-taxi service that is transforming the private air travel industry. With operations out of Hanscom Field in Bedford, Mass. near Boston, Linear Air provides short-hop private air travel at airline rates. The company offers executives and families personalized customer service, flexibility and convenience at attractive fares. Linear Air is *supported by a robust web-based customer service system* and is *served by a top management team of aviation experts*.

Linear Air, this statement signaled, could lead the air taxi market because of its unique customer service and top management team.

Similarly, ImagineAir's early "about us" emphasized that the company was participating in rather than creating the air taxi market, and pointed to the its fleet and network as distinguishing features:

> Based in Lawrenceville, Georgia, ImagineAir is committed to *providing* safe, affordable, and reliable on-demand air taxi service throughout the Southeastern United States. With its fleet of new Cirrus SR22-GTS and Eclipse 500 very light jet (VLJ) aircraft and a network of thousands of underutilized airports, ImagineAir makes regional travel easier, faster, and more comfortable than ever before.

Consequences

Our analysis suggested that visionary firms' efforts to construct meaning for a new industry can have unintentional consequences. Their activities require symbolic commitment to a specific – and often highly visible – vision of *what,* precisely, the industry is. If they shift their ideas about the industry, they risk being perceived as inconsistent and thus alienating stakeholders.

As a result, DayJet and SATSAir committed to a particular vision of what the air taxi market was: DayJet consistently described it as a "very light jet market;" SATSAir as an "air taxi" or "air cab" market. In contrast, opportunist firms tried out different claims about the market. Before 2009, Linear Air's "about us" described the market in seven different ways, as everything from an "air taxi," to "point-to-point jet charter," to a "personal jet air taxi." Moreover, Linear Air's press releases often mentioned multiple market claims at the same time: a 2007 press release, for instance, described the company both as a "jet charter" and an "air taxi service." ImagineAir's "about us" described the market in three different ways, as everything from "on-demand personal air transportation," "on-demand aircraft operator," to "on-demand air taxi." Table 4.5 provides further evidence of these differences and their consequences.

Table 4.5: Evidence of Constructing Meaning and Consequences, 2004 – 2009

Disseminating Stories			
Speaking events	*N*		
DayJet	10		
SATSAir	6		
Linear Air	6		
ImagineAir	3		
Founding stories	*N*	*Repeated elements*	
DayJet	20	Experience changing/launching new markets; focus on solving problems; vision for air travel; team's outsider experience.	
SATSAir	6	Extensive airline experience; focus on solving problems; vision for air travel.	
Linear Air	8	Entrepreneurial experience.	
ImagineAir	5	Youth and open-mindedness.	
Theorizing Category Comparisons			
About us	*New market*	*Existing market*	*N*
DayJet	69.2%	30.8%	26
SATSAir	94.1%	5.9%	17
Linear Air	0%	100%	34
ImagineAir	0%	100%	4
Comparisons	*Emphasis on distinctiveness*	*Emphasis on similarity*	*N*
DayJet	71.4%	37.1%	35
SATSAir	77%	23.1%	13
Linear Air	26.5%	85.7%	49
ImagineAir	51.9%	74.1%	27
Comparisons to air charter	*Emphasis on distinctiveness*	*Emphasis on similarity*	*N*
DayJet	58.3%	41.7%	13
SATSAir	66.7%	33.3%	6
Linear Air	0.4%	96.6%	29
ImagineAir	21.4%	78.6%	14
Signaling Leadership			
About us	*Creating a market*	*Competing in market*	*N*
DayJet	100%	30.8%	26
SATSAir	100%	23.5%	17
Linear Air	0%	100%	34
ImagineAir	0%	100%	4
About us – capabilities and resources	*Relevant to market creation*	*Relevant to leadership*	*N*
DayJet	100%	30.8%	26
SATSAir	100%	5.9%	17
Linear Air	0%	100%	34
ImagineAir	0%	100%	4
Consequences			
Market category claims	*Number of categories*		*N*
DayJet	1		30
SATSAir	1		37
Linear Air	7		59
ImagineAir	3		9

4.3.3 Committing to Partners

Entrepreneurs often dedicate significant effort to committing to partners through, for instance, forming alliances, developing exclusive relationships with suppliers, and signing up for industry-wide associations (David et al., 2012). These substantive commitments can result in both tangible advantages – access to resources and supply channels – and symbolic benefits for their firms (Stuart et al., 1999; Khaire, 2009). Our analysis indicates that new firms in nascent industries commit to partners through two processes: *establishing partnerships* and *engaging with inter-industry associations.* "Establishing partnerships" involves forging and promoting relationships with suppliers and complementors (Santos and Eisenhardt, 2009). "Engaging with inter-industry associations" involves building or participating in industry-wide research projects, associations, or training efforts (Rao, 1994; David et al., 2012).

Our analysis revealed that visionary firms make strong substantive commitments to partners. They forge and promote alliances with specific suppliers and complementors; they play a leading role in building industry-wide associations. Through these efforts, they aim to shape or create the market's boundaries: their relationships help determine the perimeter of the market, specifying who is in and who is out (Santos and Eisenhardt, 2009); their associations standardize practices and stabilize membership (David et al., 2012). Opportunist firms, in contrast, make weak substantive commitments. Although they forge relationships, they remain open to working with multiple and changing suppliers and complementors; although they participate in industry-wide associations, they do not play a leading role. They engage in both efforts to build competitive advantage for the firm: their relationships bring specific benefits; their associations build legitimacy. Table 4.6 summarizes these mechanisms.

Table 4.6: Committing to Partners, 2004 – 2009

	Mechanisms	
	Developing Partnerships	**Engaging with Inter-Industry Associations**
Definition	Forging relationships with suppliers and complementors.	Building or participating in industry-wide research projects, associations, training centers.
Visionary Mindset	Forge and promote strong alliances with specific suppliers and complementors.	Build associations.
Rationale	Relationships determine perimeter of air taxi market.	Associations standardize practices, stabilize membership in air taxi market.
DayJet	Strong alliances with specific FBOs, local airports, government associations. Announced affiliations emphasized firm's role in creating the market. Strong alliance with Eclipse, VLJ manufacturer. Promoted uptake of Eclipse-500. White-papers for FBOs and local airports on value of on-demand model.	Inspiration for formation of Air Taxi Association. Began building VLJ "center of excellence" for pilot training. Launched government-industry partnership to explore development of new technologies enabling the air taxi market.
SATSAir	Strong alliances with specific FBOs, local airports, government associations. Announced affiliations emphasized firm's role in creating the market. Strong alliance with Cirrus, single-prop turbo-piston manufacturer. Promoted uptake of Cirrus SR-22.	Emphasized leadership in Air Taxi Association. Conducted research with NASA, FAA on need for market; presented at industry-wide trade show.
Opportunist Mindset	Forge relationships with multiple suppliers and complementors.	Participate in associations.
Rationale	Relationships lead to firm-specific advantage.	Affiliation with associations leads to firm-specific advantage.
Linear Air	Strong alliances with specific companies. Announced affiliations emphasized unique advantages or distinctions they would bring to the firm. Supplied by multiple aircraft manufacturers; served multiple FBOs, local airports.	Participated in Air Taxi Association; emphasized participation to build legitimacy for company.
ImagineAir	Considered multiple aircraft manufacturers; served multiple FBOs, local airports.	Participated in Air Taxi Association; emphasized participation to build legitimacy for company.

Developing Partnerships

DayJet. DayJet forged strong alliances with specific complementors that could support or supply the air taxi market: local airports, state governments, and fixed-base operators (FBOs) that offered maintenance services including airplane hangaring, fueling, and maintenance. Most of these partners were institutions rather than companies: 72.7% of DayJet's announced partnerships were with airports or governmental bodies, while only 25% were with specific businesses. DayJet executives actively courted institutional partners: the firm, for instance, published a series of white papers explaining the benefits for local airports and FBOs of hosting on-demand operators in general and DayJet in particular. The purpose of these partnerships was creating and enabling the air taxi market. In press releases, 90.9% of the company's affiliation announcements emphasized how the partnerships were changing air travel or a geographical region; only 9% emphasized their firm-specific benefits. For instance, a 2007 press release about DayJet's affiliation with a local airport quoted a Florida Congressman: "*Aviation is critical to Florida's economy*, and DayJet introduces a major innovation in air transportation that will *bring great benefits to the state and the nation*."

DayJet also developed strong relationships with the aircraft manufacturer its founder believed would supply the market. The founder's vision for the air taxi market privileged the Eclipse 500 VLJ: a 2005 press release stated that DayJet's affiliation with Eclipse would "*launch a new form of regional business travel* that will change the way that people live and work. Affordable, personalized on-demand jet travel is nearing reality." DayJet's business model thus relied on a fleet of Eclipse 500s. Executives collaborated closely with Eclipse leaders, and the company placed the largest single order of Eclipse's airplanes. In an interview, an industry analyst described how "the epicenter of the air taxi idea was DayJet and Eclipse."

Because its founder and executives believed the Eclipse 500 was the enabling technology for the air taxi market, DayJet promoted an uptake of the aircraft. For instance, during the 2005 SATS

conference, DayJet's founder spoke about the "confluence" of Eclipse 500s and new ideas about the air taxi market, and how together, the two would reshape aviation. In an interview, an executive explained: "We thought the Eclipse 500 was a good airplane to *start the market with*."

SATSAir. Like DayJet, SATSAir also forged alliances with airports, governmental bodies, and FBOs; 42.9% of its announced partnerships were with institutions rather than specific companies. In its press releases, SATSAir described the purpose of 57.1% of these affiliations as creating and enabling the air taxi market, and helping bring about broader change. For instance, a 2005 press release announcing SATSAir's alliance with the aircraft manufacturer Cirrus alliance quoted the Cirrus CEO: "SATSair is the first to actually *implement the air taxi concept*... Cirrus is proud to be a 25% partner with SATSair in this *exciting new area of aviation*." A 2006 press release announcing a partnership with the Florida Aviation Trades Association quoted its director: "FATA is looking forward to working with SATSair to *promote the general aviation industry* to *make air taxi service an integral part of how Florida does business*."

SATSAir also formed a strong alliance with Cirrus. The founders' vision relied on the Cirrus SR-22 aircraft. "When I first saw the aircraft and met the Cirrus founders, I thought, wow, this is revolutionary," a founder recalled in an interview. SATSAir executives thus worked closely with Cirrus, which became a major shareholder by buying 25% of the company in 2005, and the company committed to an SR-22 fleet. A founder explained in an interview: "The only aircraft for an air taxi as opposed to a charter is a low-cost plane…. You have to think about what kind of aircraft you want for what kind of mission. And an *air taxi needs a low-cost aircraft like the Cirrus*."

Like DayJet's, SATSAir's executives promoted an uptake of the SR-22 throughout the air taxi market. In an interview, one of the founders explained:

> *I helped Cirrus sell their idea*…. I talked to people in India, in South America, in Australia, who wanted to start air taxi companies. I talked to people all over the US at shows. Cirrus would send them to me to talk to me about getting started…. *We probably spawned 12 or more Cirrus operations in the US alone*.

Linear Air and ImagineAir. In contrast, Linear Air and ImagineAir established weaker partnerships. ImagineAir did not announce any significant alliances or partnerships before 2009. While Linear Air forged relationships with a number of partners, most were smaller companies: for instance, a bus company that would transport customers to Linear Air's airports; a resort in Nantucket that the firm would fly to. 70% of Linear Air's announced affiliations were with companies; 30% were with institutions like governmental bodies or airports. The announced aim of 90% of partnerships was bringing about a firm-specific advantage. For instance, a 2008 press release announcing Linear Air's participation in the Virgin Charter Marketplace quoted the founder:

> We are thrilled to be a part of the Virgin Charter Marketplace and look forward to servicing their customers throughout the Northeast, mid Atlantic and eastern Canada…. *Linear Air's inclusion in this select network speaks to our outstanding service and safety record*, of which we are very proud.

Table 4.7 summarizes differences in the firms' announced affiliations.

Table 4.7: Announced Affiliations

Partner	*Government, Airport*	*Private Company*	*N*
DayJet	72.7%	25%	11
SATSAir	42.9%	57.1%	7
Linear Air	30%	70%	12
Emphasis	*Market Creation*	*Firm Capabilities*	*N*
DayJet	90.9%	9.1%	13
SATSAir	57.1%	71.4%	6
Linear Air	10%	100%	29

Finally, Linear Air and ImagineAir's founders considered flying with multiple aircraft: Linear Air operated Cessna Grand Caravans before adding Eclipse 500s to its fleet; ImagineAir ordered both Eclipse 500s and Cirrus SR-22s. The founders did not promote the broader uptake of these aircraft. While DayJet's press releases described how its partnership with Eclipse would launch a new market, Linear Air's press releases emphasized the benefits the Eclipse would bring to the firm. For instance, the 2005 press release announcing the firm's commitment to an Eclipse purchase stated: "the revolutionary new Eclipse 500 aircraft *will allow the company to expand its existing propjet service* to smaller markets within point-to-point 500-mile regional networks and around major metropolitan areas."

Engaging with Inter-Industry Associations

DayJet. DayJet played a prominent role in launching and leading inter-industry associations. In 2007, a number of air taxi firms, including DayJet, formed the Air Taxi Association. The Association's founding press release listed a DayJet executive as its Chairman of the Board. In the press release, he explained how the purpose of the Association was setting industry standards:

> *DayJet helped inspire the formation of the Air Taxi Association*, and we applaud its launch…. I'm honored to serve the Air Taxi Association and the next generation air taxi industry as the ATXA Chairman of the Board. Together, ATXA members will work to *set industry standards that benefit all of aviation and air taxi service worldwide*.

DayJet also launched several associations that aimed to stabilize practices in the air taxi market through, for instance, offering training and promoting new technologies. DayJet executives worked on a VLJ "center of excellence" that would, according to a 2006 press release, focus on: "The development of an education program and curriculum, in cooperation with the FAA, leading aeronautical universities, WorkForce Florida, Inc., and Florida's Agency for Workforce Innovation to *prepare students for careers at on-demand service providers*." In 2008, the company signed an agreement with the FAA, Florida state officials, and a university to begin a five-year research program focused on the advancement of new

aircraft technologies: according to a DayJet press release, the "partnership [is] responsible for developing *replicable procedures* that can be used for the *accelerated deployment of NextGen technologies nationally*."

SATSAir. SATSAir also played a leading role in inter-industry associations. In 2007, the company emphasized its affiliation with the Air Taxi Association in its company "about us:" "As a market leader, SATSair is a founding member of the Air Taxi Association, an organization that has banded together leading next generation air taxi companies to *increase market awareness and best practices*." The press release announcing the Association quoted SATSAir's CEO, who described the purpose of the Association as building awareness of and legitimacy for the air taxi market: "There is such a *strong need for increased market awareness of the air taxi value proposition*…. That is why we are enthused about the Air Taxi Association as a group to bridge the industry and *focus on driving market demand*."

In an interview, a founder described how SATSAir attempted to promote the air taxi market through these associations:

> We were very much out on a lot of speaking circuits. We were founding members of the AirTaxi Association. We *promoted the industry as a whole*… we were all very supportive of each other because we felt like the market was big enough for all of us. What we did not need was for any one of us to falter. So *we wanted to champion the industry, share information, help each other succeed*…. *The last thing we wanted in an emerging market was any kind of failure*.

Linear Air and ImagineAir. In contrast, Linear Air and ImagineAir did not play a critical role in inter-industry affiliations. While they helped found the Air Taxi Association, they were not active in leading it. Executives at both companies emphasized that they participated in order to build an advantage for each firm rather than the air taxi market. The Air Taxi Association's founding press release quoted Linear Air's founder, who described the purpose of the Association as benefitting the firm:

> Linear Air's mission aligns perfectly with the charter of the Air Taxi Association in speeding the growth of our next generation air taxi service….Working with ATXA, *all air taxi companies stand to benefit from common information technology system advancements* that combine inventory and offer a broader scope of geographic service options to customers.

In an interview, one of ImagineAir's founder explained how participating in associations and emphasizing the market helped build legitimacy for his firm. He described his experience talking with the press:

> I realized that *the key was to get people to understand it's not just us*. I mean, we're a really small company, but there are all the other air-taxi type and variation companies…. So we'd really push the education of, "hey, air taxi, air taxi, air taxi," and then if you happen to be in the Southeast and you're looking for one, choose Imagine Air…. So we threw in "air taxi" in there a few times, and it helped to get us more press and get the story bigger. *We were saying, "Hey, we're not just the only ones in here, we're not just a bunch of crazy kids*…. There's a company, called SATSAir, they've got 15 planes. There's a company called DayJet that's supposedly has 200 planes on order. There's a company in Massachusetts called Linear Air." So we were letting them know *it's bigger than just us*.

Consequences

Visionary firms' commitments to partners and associations can have unintentional consequences. Because these commitments are strong and highly visible – publicized and promoted as helping launch and create a new market – they can block firms' abilities to adapt to industry crises and unexpected shifts.

Air taxi operators faced an unforeseen crisis due to unexpected production delays and the eventual bankruptcy of Eclipse. The first prototype of the Eclipse 500 had been completed in 2002, and the company expected to begin shipping aircraft in 2004. But problems with the original engine coupled with certification difficulties shifted the delivery date until early 2007. Even then, Eclipse was able to produce only 100 aircraft annually, compared to the 700 the company had forecast. These costly delays and unexpected manufacturing problems had a large impact: Eclipse Aviation entered Chapter 11 bankruptcy in November 2008 and Chapter 7 liquidation proceedings in February 2009. By 2008, a total of only 260 Eclipse 500s had been delivered.

When they formed their companies, DayJet, Linear Air, and ImagineAir's founders all hoped to fly with the Eclipse 500. But only DayJet's founder's vision for the air taxi market revolved around the Eclipse, and only DayJet formed strong commitments to the manufacturer. In an interview, an executive explained how the firm was thus "locked" into flying with the Eclipse 500: "[The founder] always had this theory, that there was a way to create a business model…based on private jet travel. So he always had that concept, and *he knew the only way to make that happen would be via the technology [of the Eclipse]*…. We *pretty much locked in*."

As a result, when they faced Eclipse delays, DayJet executives did not consider shifting their model towards another aircraft. On the contrary, the firm continued to refine its business model and delayed its first flights. In an interview, an executive recalled:

> After we signed a contract with Eclipse, we basically started to build the team, build the company. We started hiring people to come on board. We were planning on that stage to launch the service, I want to say in 2004…. *And we got the phone call from Eclipse that they were changing the engines on the aircraft*…. And that simple decision delayed the production of the aircraft by two plus years. So now the earliest we would launch the service was 2006, 2007. And we had a decision to make: What do we do with the 30 people we have on board at that point knowing that we are now at least two plus years out. And we made a decision to not let anyone go and basically use this as an opportunity to get a little smarter about our operational plans and more details on our business model, launch sequence and things on those lines. So we had the team that we had in place, we *did not reduce the team when Eclipse shifted the aircraft delivery date*.

In an interview exchange, another executive described how, although he believed there might be other suitable aircraft, DayJet could not shift away from its Eclipse model:

> Executive: The passengers loved it and I loved it. It was a fabulous little ship. Like a time machine. And yet we recognized that it might have been an okay airplane to start with, but in the *longer run we'd be wanting to look at alternatives*. The Cirrus was a lot closer in some respects to what we needed.... It was an airplane that better served the shorter lengths that we were flying and the lower altitudes we were flying.
> Researcher: Did DayJet ever consider bringing Cirrus into its fleet?
> Executive: We had conversations about how it might be possible to work together. *We never actually executed on any of them.*

In contrast, Linear Air and ImagineAir adapted to Eclipse delays and bankruptcy. When he launched Linear Air, its founder hoped to eventually begin flying the Eclipse 500: in 2007 interview, he explained that "the Eclipse jet is the most important advance in aviation since the Wright Brothers." But he decided not to enter into an exclusive alliance with Eclipse; instead, Linear Air began flying in 2004 with another aircraft, the Cessna Grand Caravan, which its promotional materials described as "a proxy for the VLJ." The firm was thus protected from Eclipse delays: it could continue flying while incrementally adding available Eclipse 500s to its fleet. When Eclipse declared bankruptcy, Linear Air's founder recognized that the company would not be able to grow its fleet as quickly as he had hoped, and downsized drastically. In interviews, he described how he sought other ways to grow: in 2009, for instance, the firm began offering maintenance for Eclipse owners who could no longer rely on the manufacturer for support.

Similarly, ImagineAir's founders adapted to Eclipse delays. They had initially ordered four Eclipse 500s; because of delays, they eventually began operating with the Cirrus SR-22. Like Linear Air, ImagineAir initially signaled that it would transition to an Eclipse-led model. By 2008, however, the company switched to emphasizing its Cirrus fleet. A founder described this evolution in an interview:

> We had deposits on four Eclipse aircrafts, and that's what we were planning on initially going live with. It's unfortunate but Eclipse had a lot of delays. They kept pushing back on delivery dates, and that's when we started looking at…the Cirrus aircraft…. And at first we thought, you know, people really wouldn't want to fly in something like this because it has a propeller, single engine, and, of course, there's a small jet as opposed to that which is fast, it looks sexy, it looks safe…. [We thought], but *why not, couldn't we just try it to go ahead and get started*? Add a few Cirruses to our fleet and then eventually add on the Eclipses as a kind of a supplement? So our model went from Eclipse jets covering the entire East Coast to now we're going have the Cirrus aircraft, that's going provide an option for shorter hops, and then we're going to add Eclipse jets for longer distances.

Another founder described the company's addition of the Cirrus as an experiment: "And that turned out to work. [So we thought], *good, we solved the problem*." Table 4.8 provides further evidence of differences in committing to partners and the consequences.

Table 4.8: Evidence of Committing to Partners and Consequences, 2004 – 2009

	Visionary Mindset	Opportunist Mindset
Alliances with aircraft manufacturers	DayJet & Eclipse: In July 2002, DayJet Corporation signed a significant long-term agreement with Eclipse Aviation for the purchase of Eclipse 500 jets…. The Eclipse aircraft represents the **necessary "hardware" for DayJet's software solution to make affordable, on-demand jet travel a commercial reality**. (Press Release) SATSAir & Cirrus: "SATSair is the first to actually implement the air taxi concept. It is a successful, growing company that already has a solid customer base and is bringing in revenue," stated Alan Klapmeier, Cirrus CEO. "People are quickly realizing the benefits of flying SATSair over driving or flying the airlines. **Cirrus is proud to be a 25% partner with SATSair in this exciting new area of aviation**." (Press Release)	Linear Air operated multiple aircraft without major alliances, including Grand Cessna Caravans, Eclipse-500s. ImagineAir operated Cirrus SR-22s without major alliance.
Promoting uptake of aircraft	Pratt & Whitney Canada, Eclipse Aviation and DayJet Outline Technology Advances Set to Redefine Regional Transportation Leading Vendors Tell SATS 2005 Conference That **Convergence of Technology Innovations Will Radically Improve Travel Options in Small Regional Markets.** (Press Release) "But in the short term, **the only aircraft for an air taxi as opposed to a charter is a low-cost plane**…. **We spoke about the use of the aircraft** in our demonstrations.... I have flown [many kinds of airplanes]. And you have to think about what kind of aircraft you want for what kind of mission. And an air taxi needs a low-cost aircraft." (founder interview)	N/A
Alliances with FBOs, local airports, airline associations	"DayJet will not only provide a fast, affordable and direct mode of transportation linking Gainesville to other important Southeast cities, but it also serves as a powerful engine for economic growth," said **Gainesville Regional Airport CEO** Rick Crider. "The high-skill, high-wage jobs DayJet brings to East Gainesville are a good fit for our tech-savvy and educationally-rich community. We hope that this is just the first of many new business activities that will be attracted to East Gainesville when DayJet service begins." (Press Release) Paula Raeburn, Executive Director of the Florida Aviation Trades Association (FATA) also commented, "SATSair will mean that business and leisure travelers will have an affordable way to travel throughout Florida and the southeastern United States…. FATA is looking forward to working with SATSair to promote the general aviation industry to **make air taxi service an integral part of how Florida does business**." FATA represents general aviation in Florida. (Press Release)	N/A

Table 4.8 (Continued)

Engaging with Inter-Industry Associations		
Air Tax Association	"**DayJet helped inspire the formation of the Air Taxi Association, and we applaud its launch**," Holmes said. (ATA Press Release) "There is such a strong need for **increased market awareness of the air taxi value proposition**," said Steve Hanvey, SATSair President and CEO. "That is why we are **enthused about the Air Taxi Association as a group to bridge the industry and focus on driving market demand**." (ATA Press Release)	Founding members; membership mentioned to emphasized firm-specific advantage. "We threw in "air taxi" in [our press activities] a few times. It helped to get even more press and get the story bigger by saying, "Hey, we're not just the only ones in here, we're not just a bunch of crazy kids. There's a company in Greensville called SATSAir, they've got 15 planes. There's a company called DayJet that's supposedly has 200 planes on order. There's a company in Massachusetts called Linear Air. So we're letting them know it's bigger than just us." (Founder interview)
Other	DayJet Corporation today signed a Memorandum of Agreement (MOA) with the Federal Aviation Administration (FAA) to begin a five-year, phased implementation of proven NextGen technologies throughout Florida in collaboration with the Florida Department of Transportation Aviation Office and Embry-Riddle Aeronautical University. The agreement establishes a government-industry partnership responsible for developing replicable procedures that can be used for the accelerated deployment of **NextGen technologies nationally**. (Press Release) The **SATS (Small Aircraft Transportation System) research program** is a joint effort involving agencies such as **NASA** and the **FAA** and the experienced industry professionals who in turn applied the concept to begin **SATSair**. (Website)	N/A
Consequences	*Lack of adaptation*	*Adaptation*
Industry shock – Eclipse delays	The engine problem changed everything for DayJet. By that time, it had agreed to buy as many as 300 Eclipse jets, and it expected to put them into service and start its business in 2004. "Suddenly we had a 27-month 'insertion' in the schedule," John Staten told me. The company couldn't make its first dollar until it got its first plane, and meanwhile it had a staff to pay. Members of the DayJet team fanned out to inspect small jets then being developed—by Honda, Cessna, Embraer, and others—and **decided that it made the most sense to stick with Eclipse and wait**. (article)	"We had delivery slots…and those were getting pushed back further, of course. So in the meantime, we said, "Well, let's kind of get things started now. Is there something we can use to get our 135 certificate up and running?" We said, "Well, **let's get started with something else**. So we ordered a couple of Cirrus aircraft and then ordered a couple more. **And that turned out to work. We thought, good, we solved the problem**." (Founder interview)
Industry shock – Eclipse bankruptcy	"In general, many people in the air taxi market have gone bust… I looked at what Eclipse was trying to do and admired it – they were really trying to change the industry with a disruptive technology – but I knew any disruptive technology would eventually be risky or expensive…. I looked at DayJet's business model and briefings and thought they didn't really make sense. They…put **all of their eggs in the Eclipse basket**." (External interview)	"Then Eclipse started restructuring…. They shut down production in the middle of 2008. In November they went in to Chapter 11…. And at the time, we were building our team, looking forward to raising $5 million to continue to expand our business…. **Due to the choices that we had made relative to some of these other guys, we were in a position to be able to hang in there**….. One of ugly downsides of being an entrepreneur or being an innovator is that frequently **you have to adjust your plan**….. So we **let a lot of people go**….. **Almost the whole executive team is gone.**" (Founder interview)

4.3.4 Ossifying Beliefs

Entrepreneurs can have a lasting impact on their ventures through *imprinting* (Marquis and Tilcsik, 2012). Founders' beliefs and mental models become institutionalized as reference points for how and what choices the firm should make; these beliefs and mental models thus become persistent parts of the firm (Baron, Hannan, and Burton, 1999; Johnson, 2007). Our analysis indicates that a founder's visionary or opportunist mindset has, through imprinting, a lasting effect on the firms: the mindset shapes and guides executives' convictions about a firm's business model and approach to change.

Our analysis revealed that a founder's visionary mindset can become imprinted as an ossified belief about the need for stability in a firm's business model. In contrast, a founder's opportunist mindset can become imprinted as an ossified belief about the need for change in a firm's business model. Table 4.9 summarizes these differences.

Table 4.9: Ossifying Beliefs, 2004 – 2009

	Mechanism
	Imprinting of Founder Mindset
Definition	Founders develop strongly-held beliefs about initial business model; beliefs guide firm activities.
Visionary Mindset	Founders develop conviction that initial business model is correct and should remain stable.
Rationale	Stability necessary to create market.
DayJet	Executives emphasized belief in initial business model.
SATSAir	Executives emphasized belief in initial business model.
Opportunist Mindset	Founders develop conviction that initial business model must change and adapt based on data.
Rationale	Change necessary to exploit market opportunity.
Linear Air	Executives emphasized importance of change, adaptation of initial business model.
ImagineAir	Executives emphasized importance of change, adaptation of initial business model.

DayJet and SATSAir. Because DayJet and SATSAir founders hoped to create a new market, they thought deeply about the business model each firm should adopt to create that market. A 2005 article about DayJet emphasized how its founder had developed the firm's business model years before the firm began operating:

> Before embarking on the process of setting up the conventional aspects of an airline; crew, ticketing, operations et al., he would do something that had never been done before. He would create a completely virtual business. Instead of hiring the usual management and operational teams, he took some of the $18 million of first round funding and bought himself a posse of geeks – mathematicians, demographers and complexity scientists he calls 'ant farmers', threw in a room full of computing power and *modeled the airline in detail. Excruciating detai*l. "We've spent the last two years testing out our market model using agent based modeling, a kind of glorified Sim City, if you will," he explains, "It's a technology widely used by governments and transportation agencies to model cities, but we used it to see what would and could happen in terms of travel between geographic locations. We wanted to predict the collective behavior of business traveler communities in detail."

SATSAir's founders also thought about how to best apply the taxi model to aviation. In an interview, a founder reflected that "we decided the model would be the same as a taxi." He elaborated:

> *We researched and thought about the ways that actual local taxi companies worked*. We knew customers used them in two ways. If they went to the grocery store, the taxi would wait for them with the meter running and then take them home; if they took a cab to the airport, they didn't care about and weren't charged for its return leg. We decided to do the same thing. We decided, let's call it an air taxi, and define a service area, and as long as people are only flying within the service area, let's only charge them while they're on the plane.

Each model was thus guided by founders' vision for the air taxi market they sought to create. As they evangelized these models, founders became convinced in their viability. These convictions were imprinted throughout each firm: executives began to believe that their models were correct, and that they should remain stable. Even following the company's bankruptcy, a SATSAir founder reflected in an interview: "*Our model was right*. We just ran out of money." Similarly, a DayJet executive described his conviction in the model, years after the company's bankruptcy:

> There was never anything that gave us concerns on changing the model. Even today, right now, *I would tell you zero things I would do to change the mode*l. Zero…. There was nothing

fundamental that I would have changed then or even today. If I was restarting tomorrow morning, I wouldn't change the basis of the model itself.

Linear Air and ImagineAir. In contrast, because Linear Air and ImagineAir founders hoped to exploit a new market opportunity, they believed their business models should change in response to new information about the opportunity. In a press interview, Linear Air's founder described his beliefs about the model: "*The basic approach is test and learn*. What are you testing? What are you learning? And how do you apply that?"

These convictions were imprinted throughout each firm: executives began to believe that their models should be tested, adapted, experimented with. One of ImagineAir's founders explained the ossified belief that business model change was necessary to exploit a new market opportunity: "*The industry is still being figured out and developed – and we don't know what the best models are*. Is it that you pay for the dead lags? That you charge the customer? I don't know. I'm not really one to say that. *I'm just trying it one way because we think it might work*."

Consequences

Our analysis suggests that visionary firms' ossified beliefs can result in stable business models that do not change or adapt over time. DayJet changed its model once before its bankruptcy in 2008 (an average of .125 changes per year). In an interview, a DayJet executive reflected: "I think *nothing changed with the model*…. A lot of things that we did do were operational changes: enhance stuff, streamline the process….. But business model changes? I would say, very, very little." Similarly, SATSAir changed its model four times before its bankruptcy in 2009 (an average of .667 changes per year). A founder described how the company's "business model was *pretty-much the same* from the get-go."

In contrast, Linear Air and ImagineAir experimented with their business models through frequent changes: they added different kinds of aircraft, changed pricing models, and introduced and

removed flight specials. Linear Air and ImagineAir changed major elements of their business model nine and six times, respectively, before 2009 (an average rate of 1.5 and 1.2 changes per year); executives explained that these experiments allowed them to test the best ways to capture the opportunity created by new aircraft enabling the market. Table 4.10 describes each firm's business model changes before 2009.

Table 4.10: Business Model Changes, 2004 – 2009

	DayJet	**SATSAir**	**Linear Air**	**ImagineAir**
2004			Begin selling per-aircraft and per-seat flights (eventually removed) Flight card On-going price changes	
2005		Expand outside planned network	"Season passes" (eventually removed)	
2006		Introduce maintenance		
2007			Introduce Eclipse-500	Introduce Cirrus SR-22 On-going price changes Begin on-line booking Flight card One-day flight specials Empty-leg specials Introduce courier service
2008	Offer flights outside planned network	Change pricing model Announce order of jets	Being on-line booking Introduce maintenance & management for Eclipse-500 Corporate downsizing	

Moreover, while Linear Air and ImagineAir's founders and executives described certain changes as constant, minor experiments aimed at better capturing an opportunity, DayJet and SATSAir's founders described similar changes as major shifts for the companies. For instance, in an interview, one of ImagineAir's founders described how the company continually experimented with different pricing: "We changed our pricing a number of times" based on "distances…, service areas…, demand-based pricing." In contrast, SATSAir changed its pricing model only once, and executives described this as a major shift, although they only modified the amount the company charged per an hour of flight-time, rather than modifying the pricing structure itself. Table 4.11 provides further evidence of ossified beliefs and their consequences.

Table 4.11: Evidence of Ossifying Beliefs and Consequences, 2004 – 2009

	Visionary Mindset	**Opportunist Mindset**
Ossified Beliefs	"I truly believe it. I believe that that DayJet **proved and created a new business model** for air travel for the future, this per-seat on-demand. I look at it as we created it, we proved it but the timing was just poor. I truly believe that that business model will resurface in the future. I don't think it will resurface this year or next year but I believe there is an opportunity for that model to come back and to gain traction." (DayJet Founder interview) "The only thing we did that compromised the model – we started with the design of triangles – but we broke that because of Hurricane Katrina. We had a lot of requests to help, to bring FEMA people around, to bring many other people around. That was well outside our model and where we wanted to expand to…. But we thought, we'd want to help. And it kind of broke our optimization model. And that really hurt us…. It showed us we **need to stay with our model**." (SATSAir Founder interview)	It does sound like **we have been all over the road**! But hey, it's all about being **nimble in market like ours** that experience such hype and such a challenging restructure. (Linear Air founder email) **"I don't know what the best model is**. Is it, is it, is it you know pay for the dead lags, charge the customer? I don't know. I'm not really one to say that. **I'm just trying it one way because we think it might work**." (ImagineAir Founder interview)
Unintentional Consequences *Experimenting with model* (# of post-operational business model changes)	DayJet: 1 SATSAir: 4	Linear Air: 8 Imagine Air: 6

4.3.5 From Growing a Firm to Shaping a Market

Our analysis indicates that, as a nascent industry develops, opportunist founders eventually begin engaging in activities aimed at shaping the industry. Following DayJet's and SATSAir's bankruptcies, Linear Air and ImagineAir continued operation. Around 2010 – five to six years after their founding – Linear Air and ImagineAir began to shape the air taxi market. In 2013, Linear Air's founder explained how he had developed a new vision for the air taxi market:

> We *commissioned a market research study on the air taxi segment*, and we really see an opportunity to penetrate domestic airline market by using Cirrus SR-22 jets, engaging multiple operators, and jointly listing their flights through aggregator websites like Kayak.com. *We think that can be up to a $20 billion market.*

At the same time, because founders' opportunist mindsets had ossified as beliefs about the need for constant change, they continued experimenting with their business models.

Constructing Meaning

In 2013, both Linear Air and ImagineAir changed their websites significantly; both new websites disseminated a story about the air taxi market. ImagineAir's website included a new page titled "A New Era of Travel" that described the benefits of the air taxi market. Linear Air's new landing page – titled "Why Fly Air Taxi" – described air taxis as "a revolutionary new air travel option that makes life better for smarter travelers," and answered a series of questions, including, "How does air taxi work?.... How much does air taxi cost?.... Is air taxi safe?" Linear Air's founder described how the aim of the new website was to help "educate consumers about air taxis." In December of 2010, ImagineAir issued a press release focused on flyers' dissatisfaction with commercial travel, and promoted the air taxi market as an alternative.

Committing to Partners

Linear Air and ImagineAir also began committing to partners through strong alliances that constructed the boundaries of the air taxi market. In 2012, ImagineAir announced partnerships with a number of FBOs: through the partnerships, ImagineAir would offer new day-trip fares and services. In 2013, Linear Air entered into a major alliance with Hopscotch Air, a New York-based air taxi operator; the press release announcing the alliance described how "two *transformative air taxi companies* are teaming up." Linear Air executives also worked to convince on-line flight aggregators to list air taxi flights; Linear Air's founder described how doing so was key to "*unlocking the air taxi model*."

Linear Air and ImagineAir thus moved from opportunistically experimenting in the nascent air taxi market to helping shape it. In an interview in 2009, shortly after DayJet's bankruptcy, Linear Air's founder distinguished his attempts to capture a new opportunity from DayJet's efforts to create a new market: "I think why we're still in business and DayJet is not….is that, you know, *their strategy sort of equaled their vision which is, we're going to go out and bring low cost private air travel to the world. And we said well, you know, the world's probably not ready for it yet."*

In contrast, by 2013, Linear Air began promoting its own vision of bringing low-cost travel to consumers. In September 2013, the company's corporate "about us" described Linear Air as:

> A *pioneering innovator of air taxi services*, connecting the traveling public with select operators of air taxi aircraft via our proprietary software platform. Linear Air offers business and leisure travelers access to more than 5,000 airports in North America that are conveniently located just minutes from anywhere, using the most advanced and comfortable air taxi aircraft available. With a nine-year history of leadership in the air taxi travel segment, Linear Air is *proving* that air taxi can provide the benefits of traditional jet charter, but without the extravagant prices.

Experimenting with Business Models

At the same time, because founders' opportunist mindsets became ossified into beliefs that guided firm activities, Linear Air and ImagineAir continued experimenting with their business models. As

Table 4.12 indicates, Linear Air made seven changes to its business model between 2010 and 2013 (an average of 2.334 changes per year); ImagineAir made 3 (an average of 1 change per year).

Table 4.12: Business Model Changes, 2009 – 2013

	Linear Air	**ImagineAir**
2009	Introduce in-flight training for Eclipse-500 Introduce support services for Eclipse-500 owners	
2010		
2011	"Platinum Service" for frequent flyers Begin booking flights on local Eclipse-500 operators in Can and PA "Linear Connect:" sell excess capacity of Eclipse owners' aircraft	Remove empty-leg specials
2012	List on Hipmunk.com	Pair with FBOs to offer discounted day trips
2013	Introduce Cirrus SR-22	$1 empty-leg specials

Table 4.13 provides additional evidence of shifting priorities for opportunist founders.

Table 4.13: Evidence of Shifting Priorities for Opportunist Founders, 2009 - 2013

	Constructing Meaning	
	Linear Air	**ImagineAir**
Disseminating Stories	In 2013, website landing page described benefits of air taxi as a new market.	In 2013, website described benefits of air taxi as a new market. 2010 press release explained need for market (based on surveys of traveler opinion).
Signaling Leadership	In 2013, "About us" focused on creating a market. [Probably in body]. Based in Bedford, Massachusetts, Linear Air is a **pioneering innovator of air taxi services**, connecting the **traveling public with select operators of air taxi aircraft via our proprietary software platform**. Linear Air offers business and leisure travelers access to more than 5,000 airports in North America that are conveniently located just minutes from anywhere, using the most advanced and comfortable **air taxi aircraft available**. With **a nine-year history of leadership in the air taxi travel segment**, Linear Air is **proving that air taxi** can provide the benefits of traditional jet charter, but without the extravagant prices.	
	Committing to Partners	
	Linear Air	**ImagineAir**
Developing Partnerships	Began establishing strong alliances with other air taxi operators. Established alliances with Cirrus SR-22 operators to fly aircraft under LinearAir name. Worked with on-line aggregators to list air taxi flights on websites.	Introduced flight specials in partnership with FBOs.
	Ossifying Beliefs	
	Linear Air	**ImagineAir**
Experimenting	7 business model changes	3 business model changes

4.4 Discussion

We began our research seeking to uncover the activities that entrepreneurs pursue when building a new firm in a nascent industry. While prior research had explored select elements of entrepreneurship in nascent industries – how, for instance, entrepreneurs build a collective identity (Navis and Glynn, 2010), establish an industry's boundaries (Santos and Eisenhardt, 2009), or discover effective business models (McDonald and Eisenhardt, 2013) – we argue that the nascent state of the field called for qualitative research that focused on the entire set of these activities, and especially their interactions and trade-offs. Our grounded exploration resulted in unexpected findings that guide our theoretical contributions. We thus suggest a set of propositions about entrepreneurship in nascent industries. Of course, the purpose of qualitative research like this is to generate rather than test theory. Because we worked with four cases, we were not able to test counterfactuals, and we hope future research will examine, refine, and verify our propositions using a larger sample of firms.

First, we illuminate two distinctive founding mindsets entrepreneurs bring to a nascent industry. We believe that these mindsets represent two ends of a spectrum. On one end are visionary entrepreneurs, who consciously and deliberately attempt to create and shape new industries. On the other are opportunist founders, who stumble into a new industry by attempting to exploit a new opportunity. As is often the case with ideal types, most entrepreneurs likely fall somewhere between the two; but our research suggests each mindset gives rise to a distinctive set of activities, and comes with its own challenges. We thus suggest,

Proposition 1. In a nascent industry, entrepreneurs are likely to hold mindsets that range from visionary to opportunist.

Second, we propose that founding mindsets guide a firm's symbolic, substantive, and cognitive activities. Firms formed by visionary entrepreneurs create meaning for the industry as a whole, commit to partners, and develop ossified beliefs about the need for business model stability. Each of these activities is tightly linked to a founder's focus on creating a new industry. Industry-wide meaning-making is the enactment of founders' focus on creating a collective identity for, building awareness of, and shaping legitimacy for the industry; commitments represent an attempt to construct industry boundaries; ossified beliefs in business model stability are imprinted versions of founders' mindsets.

In contrast, firms formed by opportunist entrepreneurs create meaning for themselves, do not commit strongly to partners, and develop ossified beliefs about the need for business model changes. Unencumbered by visions of creating an industry, opportunist founders build firms that focus on their own identity, legitimacy, and pursuit of a new opportunity. We thus suggest a series of propositions linking mindsets to activities:

Proposition 2a$_1$. In the earliest phases of a nascent market, firms founded by entrepreneurs with visionary/opportunist mindsets are more/less likely to focus on constructing meaning for the market (through disseminating stories, theorizing category comparisons, signaling leadership).

Proposition 2a$_2$. In the earliest phases of a nascent market, firms founded by entrepreneurs with visionary/opportunist mindsets are less/more likely to focus on constructing meaning for the firm (through disseminating stories, theorizing category comparisons, signaling leadership).

Proposition 2b. In the earliest phases of a nascent market, firms founded by entrepreneurs with visionary/opportunist mindsets are more/less likely to commit to partners (through developing partnerships, engaging with inter-industry associations).

Proposition 2c. In the earliest phases of a nascent market, firms founded by entrepreneurs with visionary/opportunist mindsets are more/less likely to develop stable business models (through imprinting of founder mindsets).

These propositions represent a departure from current research on nascent industries. Prior studies have suggested that, in the earliest phases of a nascent market, *all* entrepreneurs attempt to build a collective identity and shape the market as a whole; as a market begins to gain legitimacy, they begin to focus on their own firms (Navis and Glynn, 2010). By specifying what firms attempt to shape an earliest phase of a new industry, our data adds complexity to this analysis.

These propositions also contribute to the growing stream of research that argues that founders' capabilities, backgrounds, resources, and reputations can have a lasting impact, through imprinting, on their new ventures (see Marquis and Tilcsik, 2013, for an overview). We show that a cognitive dimension – a founder's *mindset* – can also have a powerful effect on a new firm's activities. Our results cannot be explained by differences in entrepreneurs' knowledge or backgrounds. Our sample includes one group of founders without any, one with some, and two with significant experience launching new ventures, and two groups with and two without experience in the air travel setting; neither division can explain the difference in activities that we uncovered. Recent studies have emphasized that an entrepreneur's identity can become imprinted on his or her firm; yet research on the topic remains sparse (Fauchart and Gruber, 2011; Navis and Glynn, 2011). By illuminating the lasting and important impact of an entrepreneur's mindsets, we suggest a dimension of identity that might be especially important, and suggest founding mindsets as a potential future topic of scholarly inquiry.

Third, we propose that engaging in each of the processes we identified has unexpected consequences for founders with visionary mindsets. By defining and disseminating a vision for a nascent industry, visionary entrepreneurs restrict their firms' abilities to shift away from that particular vision; by

making economic commitments to partners, they limit their ability to respond deftly to market shifts; by ossifying beliefs around the need for stability, they become unable or unwilling to shift away from their initial business models. Thus,

Proposition 3a. In the earliest phases of a nascent market, firms founded by entrepreneurs with visionary/opportunist mindsets are less/more likely to experiment with their market claims.

Proposition 3b. In the earliest phases of a nascent market, firms founded by entrepreneurs with visionary/opportunist mindsets are less/more likely to adapt to market shifts.

Proposition 3c. In the earliest phases of a nascent market, firms founded by entrepreneurs with visionary/opportunist mindsets are less/more less likely to experiment with their business models.

This is an important departure from current literature. Most prior studies of a firm's shaping activities have focused on industry-level outcomes: that is, whether a nascent industry develops a collective identity and legitimacy (e.g. Navis and Glynn, 2010; David et al., 2012; Khaire, 2013). We suggest that, while these activities might be beneficial for an industry, they might be dangerous for the focal firm. An important exception is Santos and Eisenhardt's (2009) study, which explores firm-level effects of activities such as disseminating stories and committing to partners. But Santos and Eisenhardt do not distinguish whether these activities are directed at an industry or a firm: for instance, whether the firm disseminates stories about its industry or about itself; whether it announces partnerships by emphasizing industry-wide or firm-specific benefits. Our research suggests that industry-directed activities and processes come with unexpected costs.

We thus propose a relationship between a founder's mindset and performance. Our analysis suggests that visionary founders who set out to create a nascent industry are sometimes unable to build effective, resilient businesses. This is, perhaps, the most counterintuitive of our propositions: business history and the popular press alike are littered with stories of visionary founders – the Thomas Edisons (Hargadon and Douglas, 2001), the Elon Musks (The Economist, 2013) – who set out to launch new industries from electric lighting to commercial space travel. But our research suggests these successes might be salient but infrequent examples of visionary founders. We propose that, compared to opportunist founders, visionary founders face additional risks in launching a new venture in a nascent industry. In a nascent industry, it is unclear what labels will resonate with stakeholders, what unexpected shifts will occur, what business models will prove effective; by committing to specific visions of the industry, courses of action, and business models, visionary founders block their firms from responding if and when the industry shifts. As Dobrev and Gotsopoulos (2010) wrote, visionary founders "face the improbable task of having to guess the future of the market or industry" (1158). If their visions for the industry and their business model are correct, visionary founders can achieve dramatic success. But if their guesses are incorrect, or if they need adjustment, their firms can experience dramatic failure. Thus,

> *Proposition 4. In the earliest phases of a nascent market, firms founded by entrepreneurs with visionary mindsets are more likely to have extreme (best or worst) outcomes than firms founded by entrepreneurs without visionary mindsets.*

Finally, the opportunist founders we studied eventually began to focus on crafting a collective identity and building legitimacy for their industry. They began constructing meaning for the industry and committing to partners in order to shape its boundaries. But because the need for business model

experimentation had become imprinted in their earliest years, they continued shifting and adjusting their models. We thus propose that,

> *Proposition 5. As a nascent market evolves, firms founded by entrepreneurs with opportunist mindsets will increasingly focus on constructing meaning for the market and commit to partners, while continuing to experiment with their business models.*

Our research suggests that founders can attenuate the risk of failure in a new industry by first focusing on building their firms, and only begin to shape the industry several years into their operation.

4.5 Conclusion

Our study reveals new insights into entrepreneurship in nascent industries. In this ambiguous setting, a founder's visionary or opportunist mindset can have an enduring impact on a firm, its activities, and its success or failure. We hope that future qualitative and quantitative work on a large sample can test the implications of these insights.

APPENDECES

Appendix 4.1: Codebook for Constructing Meaning and Consequences, 2004 – 2009

	Visionary Mindset	Opportunist Mindset
Disseminating Stories *Founding stories*	Founding stories emphasize founders' shaping of market. DayJet, the brainchild of Citrix co-founder Ed Iacobucci, is a tech company at heart, but its **focus is on simplifying air travel for business executives**…. "Many techies like me grew up watching NASA moon shots and reading Popular Science, and they get into airplanes as a hobby," says Iacobucci, who retired from Citrix in 2000. "I wanted to design airplanes since I was little, and **now I can help change a market that is in dire need of some big changes**." **Much in the same way he looked to wring expenses out of running Windows and Unix by starting Citrix in 1989, Iacobucci is seeking to squeeze the high cost of air travel**. (Article) **NASA's Small Aircraft Transportation System**, based on the notion that aircraft sized to operate from thousands of under-utilized airports across the United States could dramatically alter American transportation, was **just an idea before two entrepreneurs stepped up and developed business models inspired by SATS**…. Stephan A. Hanvey launched SATSair as a true air taxi service…there are no positioning fees of any kind. (Article)	Founding stories emphasize founders' unique capabilities. Herp, a private pilot and **founder of e-Dialog**, an online marketing technology company, says he **began thinking about this business opportunity** in the late 1990s when very light jets (VLJs) were first announced…. [He] developed a business model which Herp says will allow Linear Air to be successful operating a fleet of very light jets in an air taxi operation. (Article) In fact, Sohacki said he and one of his business partners, 24-year-old Ben Hamilton, got into the business because they didn't have much to lose. The pair, who had been flying since they were teenagers, met at Georgia Tech and began seriously discussing starting their own business in their senior year of college. "**I was still young and didn't have much to lose**," Sohacki said. "So why not go out there, take a chance and **really try to do something**?" (Article)
Theorizing Category Comparisons	Emphasis on Distinctiveness We are **providing a service that never existed before**. (Article) Because, **unlike with conventional charter**, **customers only pay for the occupied leg of their journey**, the key to utilising the aircraft is "strategically placing it in our network. We need to be efficient in doing this or we are out of business," says Quist. (Article)	Emphasis on Similarity "The bottom line is that our model is **comparable** in price to airline travel, but with the **higher level of service provided by air charter companies**," said William Herp, president and CEO of Linear Air. (Press Release) I think the idea of the air taxi was to take the **ease of commercial** -- as in the booking process, purchasing a ticket, regardless of price -- and **marrying it with the convenience of being able to leave when you want** without the hassles of parking, security lines and large airport delays. (Founder Interview)

Appendix 4.1 (Continued)

Signaling Leadership		
About us	"About us" mentions creating market. SATSair is the **first** to **offer the innovative "Air Taxi" concept** based on extensive research and strategic relationships with agencies such as NASA and the FAA. Using new Cirrus SR22 aircraft, SATSair's mission is to provide safe, convenient, economical air travel and top-notch customer service. With a service area that includes much of the eastern United States, SATSair plans continued expansion, with a goal of 135 aircraft in service by the end of 2006. (Press release)	"About us" mentions competing in market. Linear Air **provides point-to-point air taxi service** with unprecedented access and affordability. Based in Concord, Mass., the Linear Air fleet includes Eclipse E500 business jets and Cessna Grand Caravan turboprops. Linear Air offers business and leisure travelers access to more than 500 cities in the Northeast and eastern Canada. Linear Air is a FAA-certified part 135 charter operator that maintains a Gold safety rating from ARG/US, the leading independent safety auditor in the aviation industry. (Press release)
About us – capabilities	"About us" emphasizes capabilities and resources that enable market creation. Founded by prominent high-tech entrepreneur Ed Iacobucci, DayJet Corporation is the pioneer of a new type of regional travel: "Per-Seat, On-Demand" jet service tailored to the passenger's individual schedule and priced only slightly higher than full-fare coach airfares. Headquartered in Delray Beach, Florida, DayJet has developed **this new industry's first real-time operations system**. Combined with the speed and efficiency of new-generation small jet aircraft, **DayJet has created the next major advance in regional business travel**. (Press release)	"About us" emphasizes capabilities and resources that enable market leadership. Based in Lawrenceville, Georgia, ImagineAir is committed to providing safe, affordable, and reliable on-demand air taxi service throughout the Southeastern United States. With its **fleet of new Cirrus SR22-GTS and Eclipse 500 very light jet (VLJ) aircraft and a network of thousands of underutilized airports**, ImagineAir **makes** regional travel easier, faster, and more comfortable than ever before. (Press release)
Unintentional Consequences *Changes in claims about the market category*	How market category is defined. DayJet Corporation is the pioneer of a new type of regional travel: "**Per-Seat, On-Demand" jet** service. (Press release) SATSair, Smart Air Travel Solutions, is the first company to offer the innovative air cab service based on extensive research and strategic relationships with agencies such as NASA and the FAA. Using new Cirrus SR22 aircraft, SATSair operates the largest on-demand next generation **air taxi** fleet in the United States. (Press release)	How market category is defined. Linear Air, a premier **air-taxi** service (2004)… a premier **jet-taxi** operator (2006)…. the leading **very light jet air-taxi** operator (2007)…. the premier **air-taxi** service (2007)…. the leading air-taxi service that is transforming regional air travel by providing affordable **point-to-point jet charter** (2007)…. the first **Very Light Jet (VLJ) air taxi** (2008)…. a provider of **point-to-point air taxi** service (2008)… a provider of **point-to-point, on-demand air taxi service** (2008)…. the leading **personal jet air taxi** service (2008). (Press releases) ImagineAir, an innovative **on-demand personal air transportation** service (2006)… provides on-demand **air taxi** service (2007)…

		the first **on-demand aircraft operator** (2007). (Press releases)

Appendix 4.2: Codebook for Announced Affiliations

	Emphasis on Market Creation	Emphasis on Capabilities
Announced Affiliations	Announcements emphasize how partnerships are changing the air taxi market, the travel industry, or a region. Today is a historic milestone for DayJet, Eclipse Aviation and the future of aviation," said Ed Iacobucci, DayJet president and CEO. "With Eclipse nearing its momentous goal of delivering the world's first VLJ, **DayJet moves closer to launching a new form of regional business travel that will change the way people live and work. Affordable, personalized on-demand jet travel is nearing reality**. With the unveiling of this aircraft, we remain on schedule to begin service in Florida by the end of this year." (Press release) Paula Raeburn, Executive Director of the Florida Aviation Trades Association (FATA) also commented, "SATSair will mean that business and leisure travelers will have an affordable way to travel throughout Florida and the southeastern United States by air without relying on scheduled airlines. The ability to travel on your schedule will make air travel the preferred way to meet with clients, take a short vacation or visit family anywhere, anytime. FATA is looking forward to working with SATSair to **promote the general aviation industry to make air taxi service an integral part of how Florida does business**." (Press release)	Announcements emphasize how partnerships are bringing unique benefits and capabilities to the firm. Linear Air… today announced its partnership with Nantucket Island Resorts and direct wine marketer Geerlings & Wade. These partnerships are **expected to further propel the air-taxi service** that has grown significantly during the past year. (Press release) The Entrepreneurs Fund (EF) www.efbv.net, part of the COFRA Group based in The Netherlands, has chosen to add Linear Air to its portfolio of investments. The fund's focus is to add support to businesses whose goal is to advance the development of innovative ideas and new markets. "We have thoroughly researched the companies in the emerging VLJ air-taxi market and, without a doubt, we feel that **Linear Air's business plan for the VLJ's, supported by their executive team, makes them the most viable company for lasting success**," says EF spokesman, Klaas de Boer. (Press release)

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