Enacting the Future: The Temporality of Strategy-making

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Abstract: Strategy-making is essentially about the future. Managers engage in strategic action in attempting to achieve competitive advantage in the short or long term. The plethora of practitioner literature on forecasting suggests that a greater understanding of these practices is needed and desirable. Yet, with a few exceptions, organizational scholars know very little about how managers actually construct the future. This paper reports on an ethnographic exploration of day-to-day strategy-making to identify the practices that managers engage in to make projections about the future. Results show that actors engage in problem solving efforts in the present, including problematization of the current situation, decision and action. To do this, they project into the future both in terms of diagnosis (possible trajectories) and prognosis (potential resolutions). But these projections are critically shaped by the past: actors draw on repertoires of accumulated knowledge from past experiences which focus their attention and shape their interpretations of the situation. Thus, strategy-making entails actors making decisions in the present while drawing on the past (in a more or less routinized way) and projecting into the future (in a more or less creative way). Depending on whether repertoires of frames and actions are reproduced or transformed in such action, the future will resemble or depart from the past. In this way, strategy-making is critically implicated in the enactment of the future, whether for stasis or for change.

Enacting the Future: The Temporality of Strategy-making

Strategy-making is essentially about the future. Managers make choices about strategic actions that attempt to achieve competitive advantage in the short or long term. Yet, strategic management scholars know little about what managers actually do to look into the crystal ball. This seems puzzling given the central, if implicit, position the future holds in strategic theories. The large managerial literature on forecasting and scenario planning (c.f., Courtney, Kirkland, & Viguerie 1997; Hamel 1996), however, suggests that a greater understanding of these practices is both needed and desirable. This paper responds to this gap by reporting on an ethnographic study of day-to-day strategy-making aimed at understanding how managers make projections about the future.

The canonical strategy literature has a good deal to say about *what* aspects of the future are important (a view of the environment, competitive position, capabilities, competitor actions – this is the content of strategy) but little about *how* managers actually develop these views and act on them. A recent special issue of Futures highlighted the need for additional research on organizational foresight (Tsoukas & Shepherd 2005). And, Das and Teng (2001) have suggested that temporality is a critical element of strategy-making. Yet, most of the content-based strategy research, while normatively focused on the benefits of strategies for the future of a firm, is backwards looking in its approach (Mosakowski & Earley 2000). Analyses attribute past factors—be they capabilities or positions—to known outcomes.

As Henderson (2000) points out, normative (perhaps "overenthusiastic") readings of the positioning (Ghemawat 1999; Porter 1980) and Resource Based (Barney 1991) theories of competitive advantage lead to prescriptions for managers to "choose a good industry" and to build the "right" resources or competencies. But, these theories offer little in the way of guidance for how to develop these insights. This and most of the content-based strategy research suggest forecasting is a largely analytical and relatively unproblematic task. Managers scan the environment for signals that might require new thinking or new analysis. The challenge according to this stream of research is primarily one of accuracy which can be improved through further data collection and more rigorous analysis. Through this process, managers may or may not "happen to discover" (Porter 1980: 163) new ways of doing things. On the other hand, the implication of the Resource Based View (Barney 1991) and behavioral theories more broadly

(Levinthal 1997; Nelson & Winter 1982) is that firms build on past capabilities through local search, and luck is the primary determinant of whether any one firm is successful. The past is the primary determinant of outcomes. More accurate expectations of the future value of capabilities are seen to generate superior returns (Barney 1986; Prahalad & Hamel 1990), but there is little information about how these expectations can be developed.

Indeed, much strategy research tends to bracket the question of how managers actually construct the future, a problem which Henderson (2000: 289) argues is "perhaps the most important issue facing strategy today," particularly in more turbulent environments where changes in future projections may be essential to firm survival (Gavetti & Levinthal 2000). We believe that tackling this question requires an understanding of how managers construct the future in their day-to-day practices. To date, developing this understanding has been complicated by the fact that many strategic research approaches reify firms as the strategic actors (Johnson, Melin, & Whittington 2003), and managers are largely absent from the analysis. Process- and practice-based researchers have opened up the black box of strategy on many dimensions (Burgelman 1991; Jarzabkowski 2005; Johnson 2000; Pettigrew 1977), but they have not focused on the question of how managers construct the future through their everyday choices.

The limited empirical strategic research on projecting the future has often raised doubts about whether such deliberate action is feasible. Mintzberg and colleagues (Mintzberg 1987; Mintzberg & McHugh 1985; Mintzberg & Waters 1985) express a cynicism about forecasting—"Companies do not have to see the future; they only need to respond to events faster than their competitors. Forecasts… may not be the answer; they may mislead"—and a belief that the only people who engage the future are "visionaries" who rely on an intuitive, not an analytical process (Mintzberg 1996: 551). They argue that because strategy emerges through learning during implementation, deliberate strategy-making (which involves projection into the future) precludes such learning. In contrast, Eisenhardt and colleagues suggest that improvisation and experiential learning are the primary means by which firms engage with the future (Eisenhardt & Tabrizi 1995), and that experimental products, use of futurists, strategic partnerships and frequent meetings are some mechanisms for doing so (Brown & Eisenhardt 1997). While useful in its articulation of a set of mechanisms, this work does not propose an underlying theory that explains how managers construct the future through their everyday practices.

In this paper, we use data from an ethnographic study at CommCorp (Kaplan 2004),[1] an incumbent communications technology company, aimed at understanding how managers made strategy in the face of the crash in the fiber-optic and telecommunications market during 2002. This setting is particularly useful for investigating future projections because the crash dramatically increased the degree of uncertainty about the future and made obsolete past ways of thinking. As a result, we expected managers' attempts to make sense of the future to be more in evidence than in more settled conditions. The study followed five different technology strategy projects – from their inception through a series of critical strategic decisions – that represented responses to the collapse of the optical communications market.

We focused on the strategy-making dynamics as they were produced in the course of situated action (Suchman 1987). Taking a practice perspective (Orlikowski 2000; Schatzki, Knorr-Cetina, & von Savigny 2000), we identified the difficulties and possibilities that CommCorp managers encountered when attempting to think about the future. Our field work suggests that managers making strategy struggled on a daily basis with ways to meet this challenge. As one of the CommCorp informants said about the telecoms crash, "Because of what has happened in the market, we now have a crisis of confidence about looking into the future."

To analyze the data from CommCorp, we drew on social theories of the temporality of agency (especially, Emirbayer & Mische 1998; Flaherty & Fine 2001; Mead 1932; Schutz 1962, 1967). This stream of research suggests that actors draw on the past and project into the future in order to act in the present in the context of current contingencies. These temporal reference points (Mosakowski & Earley 2000) shape strategic outcomes. In our analysis, we drew on the conceptual framework proposed by Emirbayer and Mische (1998) to explain the temporality of agency. By investigating the micro processes of ongoing strategy-making (Hendry 2000; Jarzabkowski 2005; Whittington 1996) through this interpretive lens, we examined temporal dynamics in practice. This allowed us to explore how agentic imaginations of the future were intimately linked to past repertoires of knowledge accumulations as well as provisional actions based on present contingencies. As actors attempted to draw together the disparate influences of these temporal elements, they generated strategic choices that constructed the future.

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[1] Names of the company, division, projects, and participants as well as key technical details have been disguised in order to protect the confidentiality of the field site and its members.

We contribute to the literature on strategy by showing that neither the past nor the future is an unproblematic feature of strategy-making. History clearly matters because managers draw on their knowledge accumulations to interpret the present as they also anticipate the future. However, to the extent we recognize what has been termed "path dependence," this is not a deterministic mechanism in the way described by evolutionary scholars but an ongoing accomplishment achieved by knowledgeable actors as they reproduce habitual views and routines in practice. Similarly, imagining the future is not simply a matter of collecting more data or building more scenarios but rather about the creative enacting of new possibilities. It is this combination of imagining (the future) with the multiplicity of repertoires (from the past) that makes strategic change in the present possible. By drawing on social theories of temporality to explore our empirical data, we develop a grounded understanding of how managers enact the future by linking the (often) contradictory temporal influences of their everyday strategy-making.

In this paper, we first examine how the literature has previously tackled temporality in strategy-making, and articulate the temporal lens we adopted in our analysis. We then describe the methods and approach we took to examining five of CommCorp's technology strategy projects. Next, we consider these data in terms of this analytical lens, and integrate the insights into a temporal perspective on strategy-making. We conclude with some implications of these insights for further research in strategy, and in particular on understanding forces for organizational stasis and change.

Temporal elements of strategy-making

Nearly all notions of time, and in particular of the future, have been either implicit or unacknowledged in strategy research (Das 2004; Mosakowski & Earley 2000). In this paper, we focus not on chronological time (according to a calendar or a clock) or even event time (significant occurrences) (Ramaprasad & Stone 1992), but on the idea that strategy-making is shaped simultaneously by past routines, present contingencies, and future projections (Emirbayer & Mische 1998).

The backdrop of a temporal perspective on strategy is uncertainty. The future is problematic precisely because it is unknown and unknowable. What Derrida calls a "monstrous future" is filled with surprises for which strategy makers cannot always be prepared; indeed, "a future that would not be monstrous would not be a future; it would already be a predictable, calculable and programmable tomorrow" (Derrida & Weber 1995: 386). In periods of relatively

slow change, actors can develop quasi-stable sets of heuristics that help guide strategic choices about direction and investment. The past perpetuates itself into the future by being reproduced over time. But to the extent that uncertainties exist, a temporal understanding of action is essential, as actors must make choices based not simply on what they see but on what they foresee (Bourdieu 1990: 81, 99). Such situations are epistemologically fraught. They resemble Giddens' (1984: 61) "critical situations" which are "circumstances of radical disjuncture of an unpredictable kind which affect substantial numbers of individuals, situations that threaten or destroy the certitudes of institutionalized routines." Uncertainties also introduce doubt and such misgivings can shift an actor out of past routines ("biographically determined situation") and make deliberation and choice possible (Schutz 1967: 78). It is this sort of disjunctive break that leads actors to make sense of the world in new ways (Weick, Sutcliffe, & Obstfeld 2005).

Recent work in social theory has sought to explore temporal elements of human action more deeply (Adam 1990, 1995; Emirbayer & Mische 1998; Flaherty & Fine 2001; Sewell 1992; Weik 2004). In particular, Emirbayer and Mische (1998) elaborate Mead's (1932) theorization on temporality in fleshing out the potential for purposeful action by individuals. Agency in their view is not just about the notion that actors "could have acted otherwise" (Giddens 1979: 56) but that they can "critically shape their own responsiveness to problematic situations" (Emirbayer & Mische 1998: 971). Emirbayer and Mische highlight how agency involves not just routine but also purpose and judgment and, thus, emphasize the creative, strategic actions of humans in engaging with their world.

Emirbayer and Mische articulate a temporal theory of agency that proposes three aspects of agency: its past (routine), future (purpose), and present (judgment). The past "refers to the selective reactivation by actors of past patterns of thought and action, as routinely incorporated in practical activity, thereby giving stability and order to social universes and helping to sustain identities, interactions, and institutions over time." The future "encompasses the imaginative generation by actors of possible future trajectories of action, in which received structures of thought and action may be creatively reconfigured in relation to actors' hopes, fears, and desires for the future." And, the present "entails the capacity of actors to make practical and normative judgments among alternative possible trajectories of action, in response to the emerging demands, dilemmas, and ambiguities of presently evolving situations" (Emirbayer & Mische 1998: all quotes from p. 971). The past, future and present aspects of agency all condition action

in the moment. It is important to note these are analytical rather than empirical distinctions and that in any instance of human agency they are each found to greater or lesser degrees.

Other management scholars have signaled the importance of temporal elements for studying strategy, but primarily for the purposes of assessing the degree to which managers "get it right" when they project into the future. Hindsight and foresight are shown to be linked but mainly as a way to demonstrate that past experiences impair foresight (MacKay & McKiernan 2004). Managers are thus seen as making blunders or errors, or instead "beating the odds" (Garud, Nayyar, & Shapira 1997). In contrast, our project is about understanding how these temporal elements shape strategic choices in the daily practice of managers making strategy. This practice view allows us to explore when creative action is possible and when action is more likely to be routinized. We take as a baseline assumption that managers are neither historical dopes passively driven by the past, nor entirely strategic agents who can achieve any future they wish, but rather knowledgeable, purposive actors who may enact new strategies in the context of present contingencies and habitual routines (Orlikowski & Yates 2002). We also move beyond an atomistic view of the individual manager (or the firm) as actor, towards a relational perspective of the interactions of actors in their social contexts. As we describe below, we use this temporal framework as an analytical entry point to investigate strategy-making in five projects at CommCorp.

Research site and methods

Our approach for this study was open-ended and inductive, informed by a broad interest in how managers make strategy during periods of high uncertainty. We followed an interpretive approach to understand how people within a single organization (CommCorp) make sense of and act towards the future (Gioia & Chittipeddi 1991). Studying specific practices within one organization is appropriate for these purposes because of the interest in examining the micro mechanisms associated with making strategy (Dougherty 2002; Pettigrew 1987).

Research setting

Our research was based on observations of strategy-making in the Advanced Technologies Group (ATG) of CommCorp, a multidivisional telecommunications equipment manufacturer and prominent player in the communications technology industry. This firm is broadly representative of large incumbent firms in the industry and has a tradition in both optical and non-optical

communications technologies. The emergence and rapid proliferation of optical technologies was tightly tied to the boom in the telecommunications industry in the late 1990s and the subsequent bust in 2000-2002. The downturn resulted in significant layoffs and budget cutting throughout the industry including at CommCorp.

Despite this economic downturn, optical technologies continued to change rapidly, generating a great deal of uncertainty, ambiguity, and confusion about such strategic issues as technology investments, product design, market segmentation, and business models. This "high velocity environment" (Bourgeois & Eisenhardt 1988) was particularly suited to an analysis of strategy-making because so much was in flux. Setting the research during the turbulent time of intense uncertainty exposed dynamics that would be buried beneath the surface during more stable conditions (Meyer, Gaba, & Colwell 2005), in particular by making more visible actors' efforts to make sense of and construct the future.

ATG was charged not just with developing technologies but making sure that these had direct relevance to external customers (the market) and to internal customers (the CommCorp business units). All investment decisions in the ATG organization were passed through a technical Steering Committee made up of senior technical personnel who reviewed and shaped projects until they were ready for a formal decision, and a Review Board made up of the group's senior management team that had the formal responsibility of approving and monitoring projects.

Following Engestrom's (2003) exhortation to "follow the object," we chose the project as the unit of observation as it connected the network of actors, technologies, and events (Czarniawska 2004) that came together to make strategy within CommCorp. The field study started with a series of unstructured interviews with ATG's senior managers and additional managers and engineers. These orienting interviews focused on developing a baseline understanding of ATG's strategy-making processes and on identifying specific projects that might be useful to study in detail. Ultimately, five initiatives that were in critical technology areas and in their early stages at the beginning of the field work were selected for in-depth study (see Table 1). These projects were also chosen to accentuate difference: they involved different kinds of technologies, were led by different people, were opposed for different reasons and followed different trajectories from initial proposal through various investment decisions. This afforded a comparative analysis across projects that allowed for the emergence of commonalities and contrasts that helped us to articulate the underlying practices entailed in enacting the future.

-- Insert Table 1 here --

The **Lightwave** project was a major effort to develop a next generation optical switch. Launched during the telecommunications bubble, the decisions during the field study were both hard-fought and highly-contested budget reductions, first a 50 percent cut and then a near complete shutdown a few months later ("cryostasis"). The **Last Mile** project focused on developing technologies to increase capacities at the edges of the network. Based on his belief that better access would increase demand and reverse the market downturn, Hugh Collins proposed a major development project, especially to look at his preferred "widget" technologies. The project proceeded through three critical decisions, first an initial exploration, second a decision to continue efforts (after Hugh marched out of a meeting when he saw the tide turning against him) and third a decision to focus on an application supporting a business unit need.

The **Module** project aimed at improving existing electronic technologies rather than introducing new optical ones. Starting as a relatively incremental project to support a customer application (first decision), it was later expanded (in conjunction with the Savior project) to look at more strategic opportunities (second decision). The **Savior** project was conceived as a means to turn ATG and CommCorp away from optics and "main carrier customers" and towards improved electronics and "enterprise customers." Initially an amorphous idea about a new strategic direction (first decision), the team spent a lot of time just trying to conceptualize the kinds of technologies needed. After "flying under the radar" for several months, team leader Vince Weston obtained initial resources to explore this new agenda (second decision) and then merged it with the Module project to help it gain traction in the corporation (third decision).

The **Multiservice** project focused on dealing with the market downturn in optics by developing bridge technologies that would avoid obsolescing customers' legacy equipment while bringing in new (sometimes optical) capabilities. Jack Stafford's group originally came up with the idea but had trouble getting funding except for a spin-off project to support a particular business unit need (first decision). The Steering Committee decided not to fund the project because no other demand for the technology could be identified (second decision), but after Jack engaged a customer in a trial of the technology and fully staffed up a team to work on it, he later received approval for a large investment in development activities (third decision).

Data collection

The approach to data collection on practices was ethnographic (Agar 1980; Van Maanen 1988). We wanted to examine events from multiple angles and through multiple methods. We relied heavily on observations of everyday activities, using interview and documentary sources of data to examine and amplify the insights generated. The goal was to uncover the daily practices of strategy-making by looking at what actors did individually and collectively to produce strategic choices.

The goal in our research was to get close to the activities of participants (Emerson, Fretz, & Shaw 1995) in order to understand the practices of strategy-making in the ATG organization within CommCorp. Drawing on roots in anthropology, ethnographic techniques have primarily entailed the researcher being physically immersed in the field. With the growing use of modern communication technologies, the meaning of "being in the field" is changing, as ethnography goes "virtual" (Hine 2000). This study combined more traditional techniques of being physically on the ground with more virtual techniques of participation via teleconference and e-mail.

The data were collected by the first author over eight months from April to December 2002 and included over 80 formal, unstructured interviews, observation of more than 30 formal and informal team meetings (from two hours to two days long), and collection of related documentation for each project (e.g., spreadsheets, PowerPoint presentations, e-mail exchanges, agendas, and minutes of meetings). This field work yielded multiple overlapping sources of data for each of the five projects, and covered a large range of scheduled meetings related to each of the projects as well as all of the meetings of the decision-making groups (the Review Board and the Steering Committee described above). As the members of the ATG organization were widely geographically dispersed, many of these meetings were held via teleconference. In addition, the on-site field work captured many informal meetings that took place by chance (e.g., as people passed each other in the hallway). Interviews were conducted with all key project participants as well as other members of the senior team within ATG. Nearly all interviews were recorded and transcribed.[2] In addition, detailed notes made during interviews and meetings were written up within a day.

[2] Two interviewees were not comfortable being recorded, and for these interviews, detailed notes were taken.

Analytical approach

The analysis followed the principles of inductive, grounded theory (Dougherty 2002; Eisenhardt 1989; Glaser & Strauss 1967). The processing of the data began during the field work: field notes of interviews or meetings included a section on insights and emerging themes which were summarized and analyzed in weekly memos. After the field work concluded, we used field notes, transcripts and archival materials to construct time lines for each of the projects covering both the events that took place and informants' different interpretations of those events at different points in time. These chronologies included quotes from the interviews, field notes and archival materials. This level of detail allowed us to locate key turning points in projects and identify the actions through which they were achieved.

We drew on categories of actions identified in prior literature on social theories of temporality to structure our initial coding of the data. Emirbayer and Mische (1998: 975-1002) provide a particularly useful list, one which management scholars are beginning to draw on for analysis of organizational practices (Cousins & Robey 2005). For examining the influence of the past, the categories include selective attention, recognition of types, categorization, maneuvering among repertoires, expectation maintenance and personal histories. For examining the influence of the present, the categories include problematization, characterization, deliberation, decision and execution, as these are accomplished through temporal improvisations, resistance, subversion and contention, local action, political decision making and deliberation. For examining the influence of the future, the categories include narrative construction, hypothetical resolution and experimentation, framing processes and innovation.

Using these categories as a starting point, we analyzed the project chronologies (using ATLAS.ti text analysis software), adding new categories as they emerged through multiple readings of the data. We iterated between data, emerging codes, and the related literature to settle on themes and relationships. We searched for patterns and underlying mechanisms by comparing across projects to discern similarities and differences and understand why they occurred.

Temporal elements of strategy-making at CommCorp

Strategy-making involves making strategic choices and taking action. These choices are often made in the face of tremendous ambiguity and organizational conflict. Across the five project studied, we observed 13 critical resource allocation decisions with a wide range of

decision outcomes. Some were decisions to cut funding (Lightwave), others to withhold funding (initially for Multiservice), others to provide some funding but less than originally requested (Last Mile), others to fund as requested by the project team (Module, Savior) and others to provide more funding than initially requested (subsequently for Multiservice). Each of these choices were made by actors who were attempting to make sense of the current turbulent times in their industry and take actions that they believed would be in the strategic interest of CommCorp given extant internal and external conditions.

A temporal perspective on strategy-making suggests that these choices were critically shaped by present contingencies, projections that actors make about the future, and repertoires of experience from the past. In this section, we explore these temporal elements of agency in the five technology strategy projects we studied, first by examining the contingencies associated with strategy-making in the present, then by detailing how actors in CommCorp project into the future, and finally by exploring the role of repertoires of past experiences.

Figure 1 summarizes the themes that emerged from our analysis and that facilitated a more systematic understanding of the mechanisms and actions associated with the temporal elements. Specifically, the influence of the present is reflected in activities of problematization and decision-making, the influence of the future is entailed in making diagnostic and prognostic projections, and the influence of the past is expressed through the habitual use of established repertoires. Below, we examine each of these themes in terms of the evidence from the five projects studied.

-- Insert Figure 1 here --

The present – problematizing, making provisional decisions, taking ambiguous action

Strategy-making at a very concrete level is about making decisions in the context of present contingencies. Actors must construct meaningful choices out of an infinite number of stimuli. The influence of the present is reflected in problematizing, making provisional decisions and taking ambiguous actions. While decision-making can be routinized over time, the key to whether new or innovative outcomes are possible is the degree to which problematizing – realizing that the situation is not resolvable through past routines – occurs. In each of the projects (see Table 2), the degree of change in the decision trajectory was dependent on the degree to which the situation was problematized. Decisions were often provisional and actions were often undertaken ambiguously so as to create options for the future.

-- Insert Table 2 here --

Problematizing and challenging existing conditions was often the trigger for changes in funding trajectories. For example, the eventual funding reduction for the Lightwave project reflected how the bursting of the telecommunications bubble played out in CommCorp decision-making. As signs of the market downturn emerged, various people attempted to use this evidence to problematize the prevailing assumption that continued substantial investment in optical technologies was required. After the Review Board meeting in December 2001 when continued funding was approved, George Arden, one of the members of the marketing group, said, "I let it go, but kept my ear to the ground. I forget if someone asked me to do this or not but Brad called a meeting and asked Jack and Hugh what the strategy for optical technologies was. It prompted me to do an analysis which showed a much smaller market opportunity for Lightwave." His effort and that of several others ultimately led to a (highly contested) decision to reduce funding, which Erik Helgesen, the head of the development group admitted was problematic and provisional,

> *The drawback is that is not easy to forecast markets. If the markets come back more quickly, CommCorp may lose some of its advantage. We should have been slower in the decision, phasing down the budget based on milestones. Brad thought it was better to act more decisively in a step function. But, this reduction allows ATG to put more focus on Multiservice and other projects. We could not have started Last Mile without taking money from Lightwave.*

This example points out how projections into the future (in this case, that the optics market was damaged for the long term) bound actors in the present. Such projections involved commitments and ultimately constrained how actors thought about the problem over time.

In this uncertain context, actors made *provisional decisions* and took *ambiguous actions.* Decisions, because they were inherently provisional, also opened up space for additional changes. Implementation of these decisions often occurred in ambiguous ways. After the decision to stop funding Lightwave, Jack Stafford split out two projects for separate funding requests as if they had not originally been part of Lightwave, while putting the rest of the project in "cryostasis." Thus, Jack's implementation demonstrated flexibility of action even in the face of a seemingly clear decision. Brad emphasized the need to keep future options open:

> *What does 'cryostasis' mean? We are putting Lightwave on the shelf now, but what would it take to relaunch? I'm not saying we are going to relaunch in January, but let's talk about a plan. I strongly believe photonics is the future.*

In the case of Multiservice, the initial decision not to invest (decision two), was triggered by Tom Rentham's findings that there is "no solid pull from the business units yet, but the

technical team has a strong belief on their own that it is important." As a result, he could not build a business case that justified the investment. Theresa Veneto noted that the decision can only be provisional as, "There is no business unit saying, 'give it to me now,' so the question is: 'If there is no immediate pull, do we shelve it?' It won't be a black and white decision."

The future – diagnostic and prognostic framing

While decision-making is often portrayed as an activity that takes place in the present in response to immediate contingencies, we found that decisions within CommCorp were shaped by imaginations of the future. CommCorp managers recognized both the necessity and difficulty of thinking about the future. Erik highlighted this challenge in developing strategies for moving forward when he noted, "The key to understand is that they cannot get an accurate picture of future demand. Who today in this marketplace has accurate data? Everybody failed to forecast the market accurately." In a Savior team meeting, George described his frustration in evaluating the market opportunity:

> *I have information to put together a white paper on who is using it and some of the benefits. But, where I am having difficulty is in putting together a business case for CommCorp. There's a gap. You can describe the application and some of today's technologies, but there isn't information on the future.*

Frustrated by the forecasts of the market demand for the Lightwave project, Theresa echoed similar concerns about sources of data: "The problem is that often people use the analyst reports and analysts don't have a good perspective on technology use in the future."

Despite these difficulties, in order to make strategic choices, CommCorp managers were called upon to develop frames about the future. These came in the form of diagnosis (understanding emerging challenges for the future) and prognosis (projecting solutions to these challenges) (see Table 3). While these categories were derived inductively from the field data, they are consistent with research on framing in social movements that suggests diagnostic and prognostic frames motivate action (Benford & Snow 2000; Campbell 2005).

For example, we found that *diagnostic frames* contributed to the participants' understanding of the problem. Actors developed narratives and scenarios about whether user demand for bandwidth would increase in a linear or discontinuous manner; whether server manufacturers were customers or competition; whether CommCorp could manage the economics of the access business. The managerial cognition literature's characterization of frames has focused almost exclusively on these kinds of diagnostic frames, including, the environmental

landscape (Gavetti & Levinthal 2000; Levinthal 1997), nature of the technical change (Garud & Rappa 1994; Tripsas & Gavetti 2000), the competitive structure (Daft & Weick 1984; Porac, Thomas, & Baden-Fuller 1989; Sutcliffe & Huber 1998), and the degree of threat or opportunity, munificence or scarcity in the environment (Dutton & Jackson 1987; Gilbert & Bower 2002; Jackson & Dutton 1988). We found that CommCorp managers struggled to form projections about each of these features of the future.

-- Insert Table 3 here --

Prognostic frames contributed to participants' understanding of the appropriate solutions to the challenges and tensions raised by the diagnostic frames. The managerial cognition literature had paid less attention to prognostic frames (for an exception, see Garud and Rappa's (1994) analysis of scientists' different views for how the cochlear implant should be developed). However, field work in CommCorp suggests that different frames of the appropriate solutions emerged in the unfolding of the five projects: whether a project was an incremental line extension or a platform for a radical technology; what form a solution should take (e.g., whether a solution was best implemented in hardware or software); or whether a project would take advantage of existing corporate capabilities or obsolete them. The stories from the five CommCorp projects highlight that these diagnostic and prognostic projections were often highly contested within the organization, and the process of making such projections was problematic for the actors participating in each of the projects.

The past – using established repertoires

But, where do these projections come from? What are the source materials? Our evidence suggests that actors drew on the past to frame the future. The past is reflected in the influence of interpretive repertoires of knowledge accumulations based on prior experiences. People "invent the future" by breaking up past events into their components and potentially combining them in unforeseen ways (Jacob 1982: 58). Fieldwork at CommCorp suggests that these repertoires emerge from both individual and collective experiences (see Table 4). Such experiences contribute to an accumulation of knowledge that individuals can draw on in particular contexts (c.f., "stocks of knowledge" (Schutz 1967)). Individuals' life histories – including project experience, training, work at other companies and professional affiliations – and knowledge from participation in organizational routines as well as group, corporate and industry cultures all contribute to actors' repertoires. This suggests that it is most useful to characterize an actor as

having not one but rather multiple histories (Flaherty & Fine 2001; Mead 1932) that may provide varying and sometimes conflicting resources from which actors can draw.

-- Insert Table 3 here --

Sources of repertoires were multiple. Vince Weston, the leader of the Savior project, attributed the strong differences in views about the direction of the company to individual experiences:

> *All I can think of is that they are products of their environment. Susannah has a lot of product line management experience and gets product economics. I was in the venture/deal-making part of CommCorp so I understand business cases. The others don't have that kind of background. For example, Vijay just sees the Module project for its technical merits. Stephen thinks that the entire vision of Module is to sell it to [Customer X]. Everyone only sees his slice of the pie.*

At the individual level, these accumulations of knowledge reflect particular project experiences. In the Last Mile project, Hugh Collins, the project leader, had worked on multiple access technologies in the past and the "Widgets" optical technology in particular. Not surprisingly, he was drawn to the idea that access would be the solution to the glut in the optical market and that Widgets would be the right specific solution. Another source of accumulations is the specific training and education obtained by individuals. ATG included both optical and electrical engineers, both hardware and software engineers, and both technical and business personnel. And Stephen attributed resistance to the Module project (which would replace some software functions with hardware) to differences in training: "you are either a hardware person or you are a software person. There is always a pull between…the two."

Organizational and industry cultural influences also shaped repertoires. For example, ATG was a group that had been reconstituted from the old "CommCorp Labs." This led to a "Lab Mindset" that predisposed some people to developing technologies absent any consideration of market needs. In addition, there were cultural norms that divided the technical and business community and contributed to the different approaches that could be drawn on in practice. Jack Stafford's frustration in moving the Multiservice project ahead came from such differences:

> *We [in the technology group] have a broad knowledge about what is happening in the industry and the way this technology could help. The question is how to get [the marketing] people to move beyond their mind blocks…*

The *use of repertoires* was unpredictable due to their polysemous nature (Sewell 1992). Established repertoires both constrained and enabled the multiple kinds of interpretations that actors made of emerging conditions. Chris Chang's (a member of the Review Board) view of

Multiservice was shaped by his understanding of the historical development in network architectures where, as he put it,

> *The change starts as an internal network connection within the carrier and then later became a service (such as T1's, ISDN). In both cases, the first definition of the standard intertwines the service and management aspects and only later are they separated out in order to facilitate the creation of services. Multiservice might work in the same way.*

In the Last Mile project, there was a tremendous amount of conflict about potential interpretations of the market for access technologies culminating in a tumultuous Review Board meeting during which Hugh walked out mid-meeting. In reflecting on this conflict, Brad Copeland, the head of the ATG organization identified individual repertoires as an important contributing influence: "So, I think that part of the issue is the design community at large has only a subset of information upon which to draw for solutions and perhaps do not have the same business grounding that other areas of the company do."

These repertoires and routines often became deeply embedded in the organization to the extent that they are continually and uncritically reproduced over time. For example, the view that optical technologies were the key technology for the future of telecommunications had been deeply ingrained in the organization during much of the 1990's, during the run up to the bubble. As such, there continued to be strong resistance from the Lightwave project team to acknowledge the impact of the changing market conditions (the crash of the optical market). In a December 2001 Review Board meeting, despite new evidence that the CommCorp long-haul business had dropped a related optical product, management provided continued funding to Lightwave to develop new optical technologies.

In summary, the evidence from these five projects provides a detailed portrayal of how actors project into the future in order to make strategic choices. It is clear however that future projections exerted influence alongside effects from past knowledge accumulations and present contingencies. Articulating and understanding such influences begins to address the empirical challenge posed by analyzing temporal aspects of agency, that of "locating, comparing, and predicting the relationship between different kinds of agentic processes and particular structuring contexts of action" (Emirbayer & Mische 1998: 1005). Such an approach makes the act of projecting into the future, which is largely implicit in existing strategy research, an explicit part of the strategy-making process.

Linking and navigating temporal elements

In this analysis, we have articulated people's practical engagement with the temporal elements of past, present and future. We show that all three exert influence when actors make strategic choices. Our analysis suggests, however, that these temporal elements influence strategy-making not only separately but in their interaction. As depicted in Figure 1 above, how actors link the elements together and navigate the inherent tensions between them is a critical aspect of strategy-making. Thus, the degree of problematization in the present can affect whether the past is drawn on in a more or less routine way and how much experimentation around hypothetical solutions occurs. Similarly, the past and future are linked through the analogies that actors use to develop their visions of strategic solutions. The past and present are linked by the amount of maneuvering among repertoires based on present contingencies.

Linking the past, present and future

The influences of past repertoires, present contingencies, and future imaginations do not operate in isolation. Actors draw on all these influences in their actions. To make strategic choices, they have to navigate and deal with the (often) conflicting directional pull that each exerts. At any point in time, past, present and future all shape to a greater or lesser degree current choices and action. Table 5 highlights the specific ways in which this navigating and linking takes place and how strategic choices are shaped as a result.

-- Insert Table 5 here --

The *past and the present* are connected by actors' efforts to characterize situations, often by maneuvering among their repertoires. For example, in discussions in the Module project team, Vince searched for a way to characterize the project so that it could be understood by people in a position to make a decision about investment: "I always keep coming back to how we are going to sell this in the organization. That is why I make reference to a successful project in the past the people can relate to, CommSwitch." Similarly, Vince and Vijay exchanged views of what the Savior technology could ultimately be, selecting, trying out, rejecting and trying other articulations. Vince: "Think of one feature of Savior as a disaster recovery web service." Vijay: "I think 'web services' is a little confusing…I think we should call it a dial tone." Vince: "OK, call it the disaster recovery dial tone."

The shifts in the ways that managers drew on the past were also more global. For

example, the decision to reduce funding in Lightwave project was the beginning of a broader shift within ATG from a pro-optical view to one more weighted to business case and customer leadership. Over time, actors were less likely to draw on the previously routinized belief that optics was the default solution for most problems, thus shifting the emphasis from the past to the future. Present contingencies thus influence how the past was perceived.

The *past is connected to the future* through the ways that actors drew on their repertoires to map out the future. The past had differing weights in different contexts. For example, when attempting to envision the future of the Module and Savior projects, George Arden struggled because his approach was heavily weighted towards the past. He got frustrated because he did not want to "reinvent the wheel" in terms of putting together data. He would have preferred to obtain data from Gartner or IDC (industry analysts) who had looked at these products in the past. On the Lightwave project, Chris Chang recognized that it would require a break with past views (the "SONET view" based on the dominant optical technology, the synchronous optical network) to map out a real future for optical technologies. At the same time, he drew on a different aspect of the past (the notion of the "copper vault" in which telecoms companies have large buildings filled with copper wire connections at major telephone interchanges) to envision an alternative future.

> *If you look at that as a problem space for optics…the problem isn't about there being a few fibers and lots of data but how do we prevent having a glass vault at the carrier as we have the copper vault today. It is a completely different way of framing the problem. It requires us to think outside the SONET view.*

Analogies, in particular, are a mechanism used by actors to connect the past to the future (Gavetti, Levinthal, & Rivkin 2005; Hargadon & Sutton 1997; Neustadt & May 1986). Team meetings on the Savior project were often comprised of long interchanges about what the right analogy for the technology might be.

> *[In an early meeting] Vince: "Basically you would become the backdoor Akamai." Grant: "I was thinking more like you would be the local Mastercard, the one that collects all the money, the statistics, the billing information."*
> *[Later] Vijay: "It is like a service exchange; the value is not in the specific service but in the overall ability to change services within the rack."*
> *[In a subsequent meeting] "Savior is [product line x] duct taped to [startup z] duct taped to [startup w] duct taped to [product line y]." Vince: "The idea is to be the Dell of services. We don't want to build, just package them."*
> *[In a following meeting] Vince: "So CommCorp becomes the Motorola for the service switches. But, instead of Motorola, the value is in the packaging and the 'secret sauce.' We are the Motorola for reconfigurable service switches." Vijay: "We can become an integrator like they are." Vince: "Dell doesn't do any R&D." Vijay: "They don't have a freakin' patent. It would be interesting if we could become the Intel to all of the little tiny Dell's and Microsoft's. Or would be*

become the Dell? Partially Dell and partially Intel."

These exchanges were attempts to understand the potential for a highly amorphous technology. Choosing one of these analogies would give them a sense for how to proceed in the future.

The *future was linked to the present* in the deliberation of possible trajectories and experimentation with hypothetical solutions. Sensemaking in the present sometimes conflicted with projections into the future. Actors attempted to balance future projections with current market pressures. This tension was particularly acute in the Last Mile project, where the battle between optimistic and pessimistic views of the future and between optical and non-optical solutions raged through many of the team meetings. Along these same lines, there were deep deliberations in the Lightwave project about future trajectories. Theresa Veneto, head of the Steering Committee, reflected on those deliberations in a follow-up email after one decision making meeting: "As per Hugh, there's a split about whether this is the time for photonic switching (some want to stick with current solutions; others – some customers and VC's – are on the photonic page). Cost reduction would be the story for now; new services are for the future." On the other hand, some projections also led to further problematization. In the Savior project, this occurred in tight iterations as each new picture of the Savior technology created new challenges to resolve (such as how security threats could be managed once they imagined the technology as centralizing security functions). Thus, the relationship between the present and the future was highly iterative in the process of making strategic choices.

Navigating the tension among temporal elements

The key challenge set out in this paper is to understand how actors look into the future to construct choices out of ambiguous sets of possibilities. We have argued that this is a social process involving possible trajectories in which actors (implicitly and explicitly) attempt to balance the weight of the past with inventing the future.

The ways that the managers in the ATG organization connected the past to the present and future demonstrate that the past was not a singular guide to the future. In fact, it is the very polysemous and ambiguous nature of the past (Sewell 1992) which allowed the repertoires to be reconfigured in new ways. Actors drew differently from their repertoires in different contexts. In this sense, the repertoires operated in much the same way as Swidler's (1986) cultural "tool kits" which are a resource for actors as they choose how to act in the present. Consistent with Schutz's (1978) conceptualization of purposeful action, the past both constrained and enabled different

trajectories. History mattered, but in different ways than those attributed to it in evolutionary theories, and as such the past is more appropriately seen as "a resource, not a cage" (Flaherty & Fine 2001: 153).

In this view, the weight of history is not deterministic. "Path dependence" is an achieved result that emerges from the ways that actors enact strategic choices and action over time. This would suggest that if repertoires of knowledge accumulations and routines are deeply embedded, then actors are less likely to project new ideas. Similarly, the more that people imagine and negotiate innovative views of alternative futures, the more degrees of freedom they have relative to the past. Actors can exercise their agency to "resee" the past (Strauss 1969: 67). The more a situation is problematized (in the present), the more likely actors will draw on the past in novel ways and project new frames of the future

These data suggest that there were particular individual and organizational characteristics that contributed to the ability to project into the future and to the resulting weighting of the past and future. The emphasis on the future depended on whether actors engaged in practices that helped to navigate the task of projection. These practices were emphasized to a greater or lesser degree by different people and across different projects. Some involved connecting to sources outside the company such as membership in standards bodies, participation in industry "roundtables" (as Edward did on advances in videoconferencing), working with university researchers (in both the technical and economics arenas) and surveying startups to figure out what they were doing in particular technical arenas (as Hugh did with "widgets" technology for the Last Mile project or Vince did to scope out the parameters of the Savior project). Other approaches focused on making internal connections in ATG and CommCorp more broadly such as Edward's ad hoc group to look at the potential for "killer apps" to drive broadband demand, the CEO's "Future Council" at which anyone could present new technical ideas, or "brainstorming" meeting such as the one Stephen held for the Module project to look at what applications could be enabled. They also attempted formal modeling techniques to define the parameters for future action. Jack and his team built an "economic model" for the Lightwave project that laid out the cost curves for all optical switching options to determine the conditions under which it would become cost effective. The LastMile team created a "copper analysis" model of the network based on data from Phoenix that helped determine the conditions under which copper and fiber were equivalent or differentiated.

Different people, depending on their roles, experiences, and capabilities may be more or less interested in or capable of imagining the future. Brad Copeland, the head of the ATG unit saw himself as being charged with inventing the future:

> *Part of the job that I have is to understand the horizonal landscape, what the market conditions are, where the entire industry is going, because that has significant implications to the contents of our technology portfolio. What do we invest in? There are lots of cool things we could be experimenting in, but that would be just for research's sake. And, we are not in the research business. If I cannot articulate, at least on a pro forma basis, a potential path to commercialization, then we probably shouldn't be doing it because there is no pro forma ROI. We can't defend the investment. How are we going to apply the technology to make money? Remember when I said, technology is interesting, but generating revenue from it is intriguing? Intrigue me!*

On the other hand, Stephen Merton, a relatively junior engineer working on the Module project, argued that "I don't think we should ever embark on a project that will take two-plus years to build no matter how good our situation is." Vijay described the difference between "point engineers" and "speculative engineers," suggesting that only the latter might want to get involved in the more visionary Savior project. Jack was constantly frustrated by the marketing people whom he perceived to be "linear thinkers" while the technical people, in his view, were more capable of "non-linear" views of the future. And, Vince Weston described his role as "pot stirrer, and then to pitch in when I stir the pot too much." Because of his wide variety of experiences within CommCorp, he was in a position to bridge different ideas, creating the potential for more projective agency.

It also appears that active projection into the future was more likely to occur if there was space and time for that kind of thinking. Vijay notes that he created a "habitat" for Stephen to work out his ideas for the Module project. But, later Stephen lost traction when working with a particular business unit because "they were under the gun at the time due to production problems with their products and didn't have time to think about the future." Vince got frustrated in pushing the Savior project: "Savior is an effort to make projects like Module more strategic. The question is: who is going to pull it all together? It seems like a problem of structure or organization: there is no place to pull together a vision."

In summary, applying a social theoretic view of temporality to rich data helps flesh out the theoretical lens and suggests additional mechanisms not previously articulated. In describing each of the temporal elements of agency in strategy-making, we have shown how they are intertwined in the navigating and linking activities of actors making strategy. Individual's actions simultaneously reflect the influence of past, future and present, though depending on the context,

these temporal elements will be weighted and expressed differently. The evidence suggests that there are particular mechanisms, such as the use of analogies or deliberations about trajectories, through which actors negotiate the balance and conflicts between temporal elements. It also suggests that there are different kinds of people, processes and structures which sway the balance in one direction or another. Strategy-making is thus not simply about making decisions in the present but also (and significantly) about how actors draw on the past (in a more or less routinized way) and project into the future (in a more or less creative way).

Conclusion: a temporal perspective on strategy-making

In this paper we have proposed grounding the study of strategy-making in a temporal perspective that takes into account actors' everyday activities that draw on and deal with the simultaneous and (often) opposing influences of the past, present, and future. Such a focus helps elucidate the practices that managers engage in as they enact the future. Analysis of the data from CommCorp suggests that the future is tightly intertwined with the past and the present in the ongoing strategy-making activities of actors. Actors problematize the current situation, as well as take decisions and actions that are often provisional and ambiguous. To do this, they project into the future both in terms of possible trajectories (their diagnoses) and potential resolutions (their prognoses). But these projections are critically shaped by the past: actors draw on and use repertoires of accumulated knowledge that both focus their attention and shape their interpretations of the current situation.

The implication is that history matters but not in the deterministic, path-dependent way assumed by many strategy scholars. Instead, to the extent that "path dependence" is evident, this is an achieved result of the reproduction of those past views in managers' knowledgeable action in the present. Similarly, the common expression "hindsight is 20-20" implies that an understanding of the past is relatively uncomplicated and broadly shared. Yet, our data suggest that different people draw on the past in different ways and that these interpretations can even shift over time given present contingencies and future projections. Our temporal perspective also proposes that establishing future expectations is not the unproblematic task implied by much of the strategic management field. Resolution is not achieved by simply obtaining more information. Indeed, data do not reveal themselves in universally or immediately coherent ways. Rather they are subject to interpretation and translation as managers deliberate and negotiate with each other to project into the future. Thus, consistent with recent articulations about

sensemaking (Weick et al. 2005), such efforts in the present have a future orientation.

Our analysis sheds light on how the temporal elements of strategy-making can explain forces for stasis and change. The strategy-making process can be quite routinized to the extent that repertoires are recurrently reproduced thus acquiring structural properties. Yet, there are many ways that managers may act creatively to produce new interpretations and new decisions. One means for change to occur is through some sort of external disruption of the system. Change in the environment that unsettles or breaks existing routines and frames may create an opening for problematization of the situation in a new way, for actors to draw on the repertoires differently than in the past and to project new trajectories for the future. Similarly, adding a new person into a situation, someone who comes with a different repertoire, may shift the attention of the group or provide new potential interpretations of the situation. Or, new learning on the part of pre-existing participants (learning from outside of their normal domains) can trigger these same openings to new interpretations and projections. On the other hand, the potential for creative action does not depend on an external disruption. The very fact that repertoires have multiple elements, that many actors are involved and that the future is uncertain means that managers can act purposefully to change the situation. An actor's primary orientation – to the past, present or future – shapes the degree to which changes can be created (Howard-Grenville 2005).

Such a temporal perspective on strategy-making thus provides the theoretical foundations for responding to the fundamental puzzle about luck vs. managerial foresight in creating competitive advantage (Henderson 2000). Managers must manage the essential tension in organizations between the influences of the past and the future. Past knowledge accumulations can manifest themselves in routines (Nelson & Winter 1982) which are tremendously effective in maintaining operations in periods of relative stability. The more these are reproduced over time, the more likely they will become competency traps (Levinthal & March 1993) when the environment changes, and as such, managers must at certain points shift emphasis from the past to the future (Gavetti & Levinthal 2000). Such shifts require a certain ambidexterity (Kaplan & Henderson 2005; Smith & Tushman 2005; Tushman & O'Reilly 1997), which, we argue involves navigating the tensions between the influences of the past, present and future.

Our field study also implies that the balance between the past, present and future can change at different times. For example, strategy is made differently in rapidly changing conditions than in more settled ones. In the former, emphasis on novelty and innovation may be

more salient than in the latter, when emphasis is more on continuity with established routines. Much of the struggle at CommCorp was over the need to move towards an emphasis on future uncertainties over past routines. Where interpretations are up for grabs, actors have to draw more on projections of the future, as the past is no longer an adequate guide. These situations require a new way of weighting and linking the temporal influences of past and future in the present.

While the shift in emphasis towards future projections was often confusing to the managers at CommCorp – they regularly admitted that they were stymied by this challenge – they enacted many different approaches for developing a sense for how the market and technologies would evolve. Brown and Eisenhardt (1997) identified several forward-looking activities (experimental products, futurists, strategic partnerships and frequent meetings) used by the companies they studied. Observation of the actions at CommCorp suggests that actors used these and many other techniques – such as membership in standards bodies, surveying startups, working with university researchers, brainstorming meetings, and formal modeling techniques – for constructing a view of the future. By implication, it appears that the specific mechanisms may be different in different firms but the enactment of forward-looking practices is common, particularly in turbulent environments. It also suggests that which techniques for future projection get used may be determined by how the present is problematized and which aspects of past repertoires are salient.

The evidence from CommCorp shows how temporality operates in the context of strategy-making in a highly ambiguous context. It also raises additional questions about the three temporal elements as well as about their interrelationships. For example, when acting in the present, what could be done to further problematize a situation? What are the limits to ambiguous decisions and action (when does preserving options in the future make the present ineffective)? When drawing on the past, what aspects of the past will be salient? How might recombinations take place? When can one deliberately act to break routines? When projecting into the future, what contexts might expand or contract the ability for creative response? Are different individuals more or less likely to be able to project into the future? In thinking about the interrelationship of the temporal modes, what are the conditions under which the balance between the temporal elements changes? What techniques or organizational structures might increase the bridging between temporal elements? What collective processes might lead to greater or lesser interpretive reflection and change? And, overall, what are the interests,

conditions and actions that sustain a particular balance between the past, present and future? How and under what conditions do managers make changes in this balance? All of these questions suggest avenues for future empirical research.

Normatively, a temporal perspective could help managers manage more explicitly the challenges presented by the unknown future. As the inventor Louis Pasteur said, "Chance favors only the prepared mind." An explicit process of projecting into the future would provide managers with the means for understanding the present and therefore reinforcing or changing strategic actions. The temporal perspective also implies that the past can predominate in the future unless managers take action to challenge the frames and analogies drawn from existing repertoires. Thus, managers would benefit from more doubting (Blackman & Henderson 2004) or challenging of currently received views. Such doubting often arises through group processes and conflicts in the organization that surface counterfactuals and test biases (MacKay & McKiernan 2004). Similarly, this perspective reinforces the value of "framing experiments" (Schön & Rein 1994) that allow practitioners to step back, reflect and reformulate the problem at hand. These experiments essentially involve the construction of new diagnostic and prognostic frames of the future.

While CommCorp is a single case study from which it is difficult to draw strong conclusions, the evidence suggests that a temporal analysis can provide new traction in understanding strategy-making. In their analysis of the field of strategy research, Mintzberg and Lampel (1999) show that different streams of research tend to focus either more on the past (e.g., positioning or Resource Based View), the present (e.g., cognition or culture) or the future (e.g., planning and design). The analysis of our data from field work at CommCorp suggests that in practice, managers act in each of these temporal contexts simultaneously. Thus, a temporal perspective focused on the work that people do to make strategy can explicitly address the mechanisms and dynamics associated with enacting the future, an issue that is only mutedly addressed in most streams of strategy research today.

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Figure 1: temporal perspective on strategy-making

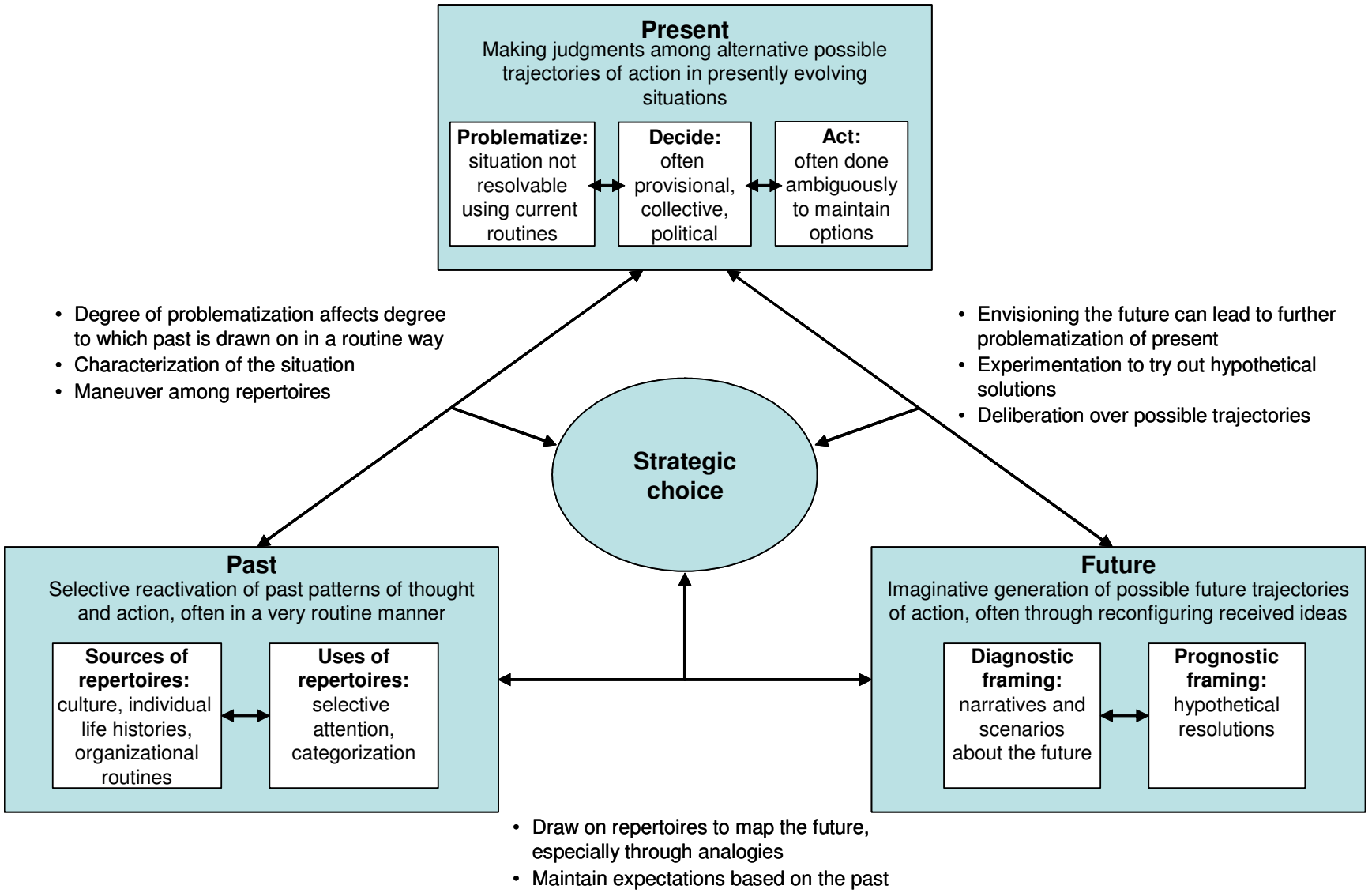

Table 1: Five projects, five responses to the crash in the optical technologies market

Project	Response to crash in optical technologies market	Key decisions
Lightwave	Need to keep up extensive investment in *next generation optical technologies*. The downturn in the industry is temporary, new optical technologies will be required soon.	• Decision 1 (June): Reduce budget for development of next generation technology by 50% • Decision 2 (November): Further reduction to point of closing the project down
Last Mile	The downturn in the industry is due to a bottleneck at the access point. Not enough individuals and business have broadband access. *New access technologies* that are relatively cheap to implement will open up demand for optical technologies throughout the system.	• Decision 1 (June): Choice to initiate major exploration project in new market • Decision 2 (July): Decision to continue investing in project for another month • Decision 3 (September): Decision to narrow focus to a particular application area, for a specific business unit and product line
Module	Carriers will not be the key customers. Instead, CommCorp needs to focus on the carriers' customers and the content providers. These companies don't need to invest in new optical technologies but rather need to *accelerate existing electronic technologies and applications*, giving CommCorp and chance to "move up the stack" from hardware to applications.	• Decision 1 (July): Addition of selected resources to develop technology for a particular customer application • Decision 2 (November): Decision to expand project scope to more strategic opportunities (merge with Savior project), invest in technology development
Savior	The need to invest in new optical technologies is minimal. Carriers will be unable to spend much on equipment in the next several years. In fact, CommCorp should refocus its efforts on the enterprise segment and on the *integration of computing and networking*.	• Decision 1 (April): Initiate exploration of new strategic direction for CommCorp • Decision 2 (September): Dedicate staff to explore ideas in major new business arena • Decision 3 (November): Merge with phase 2 of Module project, fund technology scoping effort
Multiservice	The economic downturn means that enterprises (carriers' customers) cannot afford to invest in new equipment. Yet, networks should be upgraded. Therefore, a *bridge technology* that allows multiple forms of old customer premise equipment to connect into new networks is required.	• Decision 1 (June): Investment in developing a specific function as an incremental improvement for a specific product line • Decision 2 (July): Decision not to fund larger project due to lack of business case • Decision 3 (August/ November): Informal decision to dedicate resources to the development of the technology (later ratified by Steering Committee)

Table 2: Influence of the present in ATG's strategy-making

Project	Problematization	Provisional decisions	Ambiguous actions
General themes	*Problematization of the current situation*	*Decision to act in a particular way*	*Acting to implement the decision*
Features	*Realization that the situation is not resolvable through past routines* *Can be manipulated (through improvisation)*	*Can be provisional* *Often a collective process and can be political*	*Often done ambiguously in order to maintain flexible future options* *Improvisational*
Lightwave	"It let it go, but kept my ear to the ground. I forget if someone asked me to do this or not" but Brad called a meeting and asked Jack and Hugh what the strategy for optical technologies was. It prompted me to do an analysis which showed a much smaller market opportunity. (George)	"The drawback is that is not easy to forecast markets. If the markets come back more quickly, CommCorp may lose some of its advantage. We should have been slower in the decision, phasing down the budget based on milestones. Brad thought it was better to act more decisively in a step function. But, this reduction allows ATG to put more focus on Multiservice and other projects. We could not have started Last Mile without taking money from Lightwave." (Erik)	After decision to reduce the funding for Lightwave, Jack decides to split off two projects for separate funding requests (though they should have been cut). "What does 'cryostasis' mean? We are putting Lightwave on the shelf now, but what would it take to relaunch? I'm not saying we are going to relaunch in January, but let's talk about a plan. I strongly believe photonics is the future." (Brad)
Last Mile	Working on Lightwave in 2002, Hugh realizes the biggest problem is in aggregation at the edge: "access is now the bottleneck limiting deployment at the core." "Some of the Lightwave leaders heard the business team over and over that the project should be smaller… eventually they were forced into a discussion on 'what do we do next?'" (Albert)	Last Mile proceeds through three highly contested decisions, each provisional. The first decision is to fund an exploratory phase (instead of the full project); the second decision is to continue until selected specific issues are resolved; and the third to pursue a particular technology to the extent a business unit supported it.	The second decision was to continue the project in order to resolve selected technical issues (e.g., copper capabilities). At this point, Hermann "stages a coup" to garner support from a business unit because he was not having success getting the technical issues resolved in a way that was favorable to the project.
Module	Vijay's Whitepaper on the evolution of communication and computation triggered the work on the Module project and also for Savior.	Re: decision to invest in "Super Module": "I don't have enough information to make a decision. Give me a reset by January 15. Where is the market? Why is it significant? How can we penetrate this? Through AOL? What is the channel? This is a next generation product or 1½ generations out?" (Brad)	Brad sees Module as a "Trojan horse" to lull server companies into complacency. "It's fine to partner with [company x] now but eventually I want to see them out of business."
Savior	Brad asks Vince to think about key issues for ATG and bring back some ideas. Vince comes back with an embryonic idea about Savior and Brad says that these ideas "sync matched with my ideas."	Vince "flip flops" on the level of aspiration for the Savior project: "Part of it is just me talking out loud, testing the limits. But, that's only about 30%. The other part is a tug of war on wanting to be entrepreneurial and resource limits of CommCorp." (Vince)	Merging Savior with the next generation of Module gives Vince a platform to further explore the advanced strategic issues while at the same time providing short term legitimacy in terms of a specific technology development project with a prior successful track record (Module).
Multiservice	Project triggered by a planning exercise in which Jack asked his most innovative staff to come up with ideas for new projects: "out of some of these discussions, these guys come back and said 'Gee, I think we can do this better than anybody else.'"	At initial decision not to invest, Tom says there is "no solid pull from the business units yet, but the technical team has a strong belief on their own that it is important." Theresa says, "no business unit is saying, 'give it to me now,' so the question is: 'if there is no immediate pull, do we shelve it?' It won't be a black and white decision."	While the Steering Committee refused funding (at the 2nd decision point), Jack continues working on the project, eventually finding a customer interested in the technology. He fully staffs the project and made sure the work was well under way before going back to the Review Board for approval.

Table 3: Influence of the future in ATG's strategy-making

Project	Diagnostic framing of the future	Prognostic framing of the future
General themes	*Diagnostic framing of the future* *Developing narratives and scenarios about the future*	*Prognostic framing of the future* *Hypothetical resolution by proposing solutions that will resolve multiple tensions*
Features	*Often conflicting views exist in the organization*	*Often conflicting views exist in the organization*
Lightwave	CommCorp had been working on an all optical network, but "the market kept moving away from us…it is inevitable that photonic networking is coming, but it is becoming clear that it won't materialize for at least 3-4 more years." (Erik) Re: estimates of the market size, "there is a problem because it is outside the range of the analysts who only go out to 2005, so it is hard to get a sense of the market opportunity." (Jack)	"There is probably a reasonably good story to maintain the effort…project development takes 5 years to get to market but the evaluation cycle requires projects to have revenue in 3 years…but I don't think that the executives understand that." (Jack)
Last Mile	"Oh my gosh, CommCorp has made a blunder by not being in broadband access technologies. We need to get into that space somehow ASAP or sooner." (Hugh)	Evolving prognosis by Hugh: At the outset, he positions "widgets" (an optically based technology) as the solution to the access problem. Later, as the business team provided countervailing information, he said that, "the shape of the hole is as we had anticipated: focus on small and medium enterprises, no justification for the deployment of new fiber therefore solutions will have to involve sharing of existing fiber or tandem with copper or some other medium). Widgets, however, remain at least a partial solution."
Module	A business unit leader asks Stephen and some other engineers to think about the future directions for the business. "We first try to understand what their current platform architecture as well as network architecture and software architecture are, and then we try to see what new applications could be enabled because of the technology they had. We tried to propose some, like sort of radical architectures that may enable new applications. We asked about what kind of inputs they were getting from customers that they were not able to implement because of some shortcomings in their existing product." (Stephen)	Vijay sees 'Super Module' as an embeddable blade, a creature that lives in symbiosis in a system. It could be one of the blades in the Swiss Army knife (of Savior). But, right now it is aimed at "a system over which we have little control." "With Module, [company x] is a channel of distribution, a way to sell more product. With Savior, they are the competitor because you are actually going to take away a lot of their functionality and put it in your system."
Savior	Two years before the launch of Savior, Vijay wrote a paper predicting that communication and computation would come together. "It was a shot in the dark but with no technological solutions."	Brad says that in 1996, he and Grant worked on issues related to the integration of connectivity and computing (as in the Savior project) but that "the world was not mature enough…no one thought it possible for carriers to deal with data." Re: a PowerPoint document with a list of potential services for Savior: "Here's the new deck including 5 new services for the Savior portfolio (it now has 15 of them altogether, ranging from table stakes to outright lunacy." (Vijay email to Savior team)
Multiservice	"The problem is that our current customer base has all of their legacy equipment deployed. It is all sunk cost. For them to go ahead and deploy a Greenfield infrastructure with no bridge connectivity, it's just not in the cards. No one has the capital to be able to do that. There needs to be a way to migrate and have full interoperability between the legacy traffic and the new packet traffic." (Brad)	"On the surface, Multiservice is a close-in tactical project that is near-term product oriented. In general in telecoms, things are evolutionary. But, when things have a point of differentiation, you can build on the core through phases 2, 3, 4, 5 and beyond. Multiservice is part of the solution that will converge transport to do streaming and packets and then to do new applications. So, Multiservice fits both evolutionary and radial or next generation." (Edward)

Table 4: Influence of the past in ATG's strategy-making

Project	Source of repertoires	Uses of repertoires
General themes	*Individual life histories including prior project experience, organizational routines and company culture*	*Selective attention* *Recognition of types (categorization)*
Features	*Individuals have multiple, often conflicting histories*	*Can become routinized*
Lightwave	"Lab mindset" within ATG (a holdover from the days when ATG was "CommCorp Labs") leads to a routine in which technologies are developed absent an understanding of market needs.	Resistance by the Lightwave project team to acknowledge impact of changing market conditions (crash of the optical market). In the December 2001 Review Board meeting, despite new evidence such as the fact that the CommCorp long haul business cut the related optical product, ATG management provides continued funding to the project.
Last Mile	Prior project experience: Hugh's previous work on access and "widget" technologies "The technical team members have only optical skills and background and are so frightened of change that being open to looking at the big access picture and the other non optical starting points wasn't going to be even considered." (Susannah) "There is a direct correlation between the number of years working in access [technologies] and a person's view on access now." (Hugh)	Focus on optical solutions nearly to the exclusion of alternative; even when forced to consider "no backhoe" solutions; focus only on copper and not on wireless
Module	"There are contradictory forces. There is hardware and then there is software; and you are either a hardware person or you are a software person. There is always a pull between, a tug-of-war between the two, and when you talk acceleration then you are talking replacing some of the software with hardware…" (Stephen)	"…Sometimes there is still some pushback because it is something that the software person does not know. And that is something new. So there is the change factor and the software person says, 'I do not want to, right now. I have a processor that can run all my software. I do not want to add and make it more complex by doing this, because it was difficult to do because of the way the technology works.'" (Stephen)
Savior	"Most people at CommCorp are focused on networking not computer and therefore are not knowledgeable about where computing is evolving. This convergence is being driven by the computing people: they are focused on how to build a better computer. CommCorp folks don't travel in those circles." (Rick)	Recognition of types: "If Savior is like a concept car, we probably want to have the most aggressive fabric, but if you want it to smell like a product to take to [senior executive in bu x], then you probably want to make something that follows the path of least resistance." (Vijay)
Multiservice	Jack argues that "technology is gut feel." "We [in the technology group] have a broad knowledge about what is happening in the industry and the way this technology could help. The question is how to get [the marketing] people to move beyond their mind blocks…"	Chris' view of Multiservice is shaped by his understanding of the historical develop in network architectures where "the change starts as an internal network connection within the carrier and then later became a service (such as T1's, ISDN). In both cases, the first definition of the standard intertwines the service and management aspects and only later are they separated out in order to facilitate the creation of services. Multiservice might work in the same way."

Table 5: Linking the temporal elements of ATG's strategy-making

Project	Past ↔ Present	Present ↔ Future	Future ↔ Past
General themes	*Characterization of a situation* *Maneuver among repertoires*	*Deliberation over possible trajectories* *Experimentation: try out hypothetical solutions*	*Draw on repertoires to map the future* *Expectation maintenance*
Features	*Degree of problematization affects how much past is drawn on in a routine way*	*Envisioning the future can lead to further problematization of the present*	*Analogies are a particularly powerful way to link the past to the future*
Lightwave	The decision to reduce funding in Lightwave project is the beginning of a more global shift within ATG from a pro-optical view to one more weighted to business case and customer leadership. Over time, actors are less likely to draw on the previously routinized belief.	"As per Hugh, there's a split about whether this is the time for photonic switching (some want to stick with current solutions; others – some customers and VC's – are on the photonic page). Cost reduction would be the story for now; new services are for the future." (Theresa email)	"If you look at that as a problem space for optics…the problem isn't about there being a few fibers and lots of data but how do we prevent having a glass vault at the carrier as we have the copper vault today. It is a completely different way of framing the problem. It requires us to think outside the SONET view." (Chris)
Last Mile	In Last Mile, they can't identify "killer apps," but this is because of ATG horizon of 3 years. If the technology is not in standards now, it won't be implemented in three years. Therefore, there won't be any big surprises about the market in that time frame. As a result, the business team did not do a "what if" scenario. (Susannah)	Albert: "any solution must be backhoe free." Hugh: "I agree but we must also have a solution to use as money does go in [to laying fiber]." Albert: "if we come up with a backhoe-required solution, it must be a blockbuster." Hermann: "But things may change in three years time". Hugh: "We should keep in mind that 1 ½ years ago we wouldn't have said this. We would have been gung ho. So three years from now may be different." Terrence: "We need to make sure we don't steer near the wake."	"We can't plan for unknown disruptions that may or may not come. We can consider, but not the most likely scenario. The people holding out are the ones we talk to the least. Jack and Edward are the two biggest proponents for new disruptive applications, maybe it is because of their similar backgrounds and experience." (Albert)
Module	"I always keep coming back to how we are going to sell this in the organization. That is why I make reference to a successful project in the past, [product y]." (Vince)	"Those within CommCorp that do see an opportunity tend to want to use computing as a channel for selling CommCorp products like Module. But, this is a school of thought that could lead to the commoditization of CommCorp products. We are trying to take a contrarian view." (Rick)	George got frustrated. He did not want to reinvent the wheel in terms of putting together data. He would rather have gotten data from Gartner or IDC (industry analysts) who have looked at these products in the past.
Savior	Vince: "Think of one feature of Savior as a disaster recovery web service." Vijay: "I think 'web services' is a little confusing…I think we should call it a dialtone." Vince: "OK, call it the disaster recovery dialtone."	As the Savior design is developed, Vijay points out that because this technology will "sit on the edge" of the network, it will be "vulnerable to a large number of security threats" requiring new technology solutions to address	Long series of analogies about what the Savior project could be: "the backdoor Akamai," "Swiss Army knife with different blades duct taped together, " "the Dell of Services," the Motorola for the service switch," etc. (from team meetings)
Multiservice	Susannah argues that Multiservice is too optically oriented, that Jack with his optical engineering background has not developed a solution that moves beyond the optical mindset of the bubble period.	Susannah thinks Multiservice will become "a bit of a red herring because it involves carriers replacing networks, which, in the current market environment, they are not willing to do. Until they have used up capacity, Multiservice won't make sense in a business case."	"No business unit is saying 'give it to me now', so the question is: if there is no immediate pull, do we shelve it?" (Theresa)