How Elephants Learn New Tricks: Internal and External Capability Sourcing In the European Telecommunications Industry

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ABSTRACT

This paper reports a qualitative study of European telecommunications firms between 1999 and 2002 to assess how they obtain new capabilities in the face of constraints to change. Our fieldwork, based on interviews with twenty-six executives, expands our preliminary model and identifies incentives to choose among different forms of internal and external modes for sourcing new capabilities. The emergent model intersects with several theories of business change, while providing implications concerning firms’ sequential evaluation of sourcing options.
Where do firms obtain new capabilities when they need to change? During the past quarter century, research in strategy and organizational theory has developed thoughtful arguments concerning barriers to organizational change. The theories emphasize inertia and the risks of attempting to make major changes (Nelson and Winter, 1982; Hannan and Freeman, 1984; Levitt and March, 1988; Cohen and Levinthal, 1990). At the same time, though, firms do undertake fundamental changes in their structure, systems, and business mixes (Helfat and Raubitschek, 2000; Karim and Mitchell, 2000). Recently, scholars have focused attention on the organizational processes, sometimes using the term “dynamic capabilities”, by which firms obtain, integrate, and reconfigure resources in order to change their businesses (Teece, Pisano, and Shuen, 1997; Eisenhardt and Martin, 2000; Zollo and Winter, 2002; Mitchell and Shaver, 2003). This work argues that companies sometimes search internally and at other times look outside the firm for new capabilities (Rosenkopf and Nerkar, 2001). However, the literature does not yet offer a clear distinction concerning when firms choose among different types of internal and external mechanisms for obtaining new capabilities (Eisenhardt and Santos, 2002; Capron and Mitchell, 2003). This paper develops a model of internal and external capability sourcing choices.

Two quotes illustrate both the difficulties of change and the potential for success. During the interviews for this study, a senior executive of a major European telecom company asked us:

“Can we learn new tricks as an elephant? So far, we have not been very good at dealing with new markets.”

A quote from an executive of a second telecommunications firm, though, highlights the range of options that companies can use to undertake extensive changes:

“We need to develop new resources to develop an integrated portfolio. In the Internet Protocol business, we need additional technical skills and commercial skills beyond just selling the infrastructure. In the corporate network segment, we need to hire new people from data centers and software houses. We cannot do everything on our own. We intend to use different means: hiring, alliances, acquisitions, training of internal people.”

We use a multiple case study of European telecommunications firms between 1999 and 2002 to assess the tension between difficulties of change and routes to successful change. We develop a simple orienting model to trace a mid-ground between traditional deductive research, which risks ignoring insights that arise in the field, and pure inductive research, which risks ignoring the results of previous research. We expand the orienting model by drawing on a series of interviews with senior executives. In total, we conducted twenty-six interviews at nineteen firms. Several conceptual perspectives provided guidelines for the orienting model. The
guidelines helped us explore a common set of issues during the interviews, while leaving sufficient latitude that unexpected patterns could take shape during the interviews and during our assessment of the cases. The insights helped us develop a refined conceptual model that can guide future research.

The European telecommunications industry provides a rich setting for a detailed analysis of the mechanisms by which firms attempt to obtain new capabilities in rapidly changing competitive environments. The industry has faced intensive deregulation, price competition, telecom and information technology convergence, and cross-border competition during the past decade. Telecom firms have used multiple modes of change in the face of a wide variety of pressures. The research site is particularly useful, thanks to European telecom firms’ traditional inclination toward internal development. This bias arises from historical, national protection, insulation from competition, the firms’ privileged status, and their endowments of engineering and financial skills. In spite of the heritage that emphasized internal activities, by the late 1990s these firms were using a mix of internal and external sourcing in their efforts to change their businesses. This expansion of modes provides grist to identify factors that help determine whether firms use internal or external modes of obtaining capabilities.

AN ORIENTING MODEL OF CAPABILITY SOURCING

We first define capabilities and capability sourcing modes as key concepts in the study. We develop an orienting model concerning incentives to choose among different forms of internal and external modes for sourcing new capabilities.

Capabilities, which we view as synonymous with the term resources, are the physical assets, human capital, and organizational knowledge that firms use as inputs for their business activities (Wernerfelt, 1984; Amit and Shoemaker, 1993). As the environments in which firms compete change, the firms must either obtain new capabilities or become obsolete (Penrose, 1959). We refer to new capabilities that a firm desires as targeted capabilities.

Firms can obtain targeted capabilities via internal or external sourcing. Internal sourcing refers to new capabilities that a firm creates by recombining its existing routines or creating new routines. Examples of internal sourcing include internal training, internal product development, and building new facilities. External sourcing means acquiring capabilities from a third party, outside a firm’s boundaries. External sourcing can occur by market exchanges (purchase contracts), alliances (collaborative ventures), and business acquisitions (Chi, 1994).
Figure 1 depicts an orienting model that outlines incentives to choose between internal and external sourcing modes to obtain targeted capabilities. The model begins with the idea that a firm operates in a competitive environment (S1), possessing a set of capabilities (S2). At any point in time, the firm may assess whether there is a gap between the capabilities that it possesses and those that it would like to possess in order to compete effectively. Capability gaps (A) arise because of changes in the competitive environment and changes in a firm’s perceptions of future competitive needs. The core point is that a firm may perceive a gap between the capabilities that it possesses and those that it would like to possess. We assume that firms assess potential modes for obtaining new capabilities before deciding whether to abandon the attempt to change, a point to which we will return later in the paper.

********** Figure 1 about here **********

The first question for a firm that faces a capability gap is whether it possesses relevant capabilities that it can use as a basis for internal sourcing (Q1). We define relevant capabilities in terms of two dimensions: capability closeness and capability strength. Capability closeness is the extent to which two capabilities share the same routines (Dosi, 1988). Prior work has used the notions of local versus distant search. Firms that search locally address problems by using knowledge that is closely related to their pre-existing knowledge bases (Helfat, 1994; Stuart and Podolny, 1996). At the other end of the spectrum, exploratory search requires moving away from a current knowledge base (Miner, Bassoff and Moorman, 2001). Capability strength is the degree to which the routines that make up a firm’s capabilities would suit the targeted capabilities when compared to other firms’ capabilities. Even if a firm is familiar with targeted capabilities, reaching competitive parity is an important factor in the sourcing decision (Cuervo-Cazzura, 1999). Capability relevance, then, is the extent to which a firm’s current capabilities provide the basis for desired changes, both in comparison to desired new capabilities (closeness) and relative to competitors’ capabilities (strength).

We expect firms with relevant capabilities to undertake internal development of targeted capabilities (M1). This prediction has both behavioral and efficiency rationales. Behaviorally, firms often have a bias for internal development, especially when they can build cumulatively on existing capabilities (Cyert and March, 1963). Moreover, internal development will tend to be faster, less expensive, and face fewer risks of proprietary loss than external sourcing, so long as a firm can build on existing capabilities (Nelson and Winter, 1982).
Our argument is similar to those that have been developed on the relationship between diversification strategy and entry mode (Busija, O’Neill and Zeithaml, 1997). Firms in pursuit of related diversification perform best through internal development, because they leverage internal strengths and avoid transaction costs and market auctions. Firms in pursuit of unrelated diversification succeed best through acquisition, because acquisition offers a corporation the opportunity to purchase the skills necessary to compete in unrelated industries (Dundas and Richardson, 1982).

**Orienting Proposition 1.** The more relevant a firm’s existing capabilities are to the targeted capabilities needed to fill a capability gap, the more likely the firm will use internal sourcing for the new capabilities.

If the firm concludes that it does not possess relevant capabilities to fill a gap internally, it must turn to external modes. External modes are organizing mechanisms that arise outside a firm’s boundaries and guide the exchanges that a firm undertakes with external parties through market transactions, alliances or acquisitions.

In deciding which external modes to use, the core question is the degree of market failure that the targeted capabilities face (Q2). Degree of market failure is the risk and difficulty that a market-mediated exchange would incur. Two literatures offer arguments concerning the source of market failures, and stress appropriation and coordination issues. Transaction cost economics emphasize potential opportunism as the primary driver of market failure (Williamson, 1975; Klein, Crawford, and Alchian, 1978). In this respect, sourcing transaction-specific assets from market exchange creates difficulties in screening and transferring capabilities into the firm, as well as potential leakage of proprietary knowledge (Teece, 1986). In parallel with opportunism-based arguments, the knowledge literature argues that market failure can stem from high coordination requirements (Grant, 1996; Spender, 1996). By coordination requirements, we mean the need for cooperation between providers and users in order to exchange and reconfigure capabilities (Coase, 1937). Hands-on organizational activity helps people overcome coordination-based market failures by facilitating the exchange of information that firms need to recombine current routines and develop new routines (Kogut and Zander, 1992; Foss, 1996).

At low degree of market failure, firms can typically undertake market exchange (M2). Firms often prefer market exchange, if it is viable, because this mode usually entails lower costs and less organizational disruption than the more complex process of acquiring or allying with other firms (Tushman and Romanelli, 1985; Bowman and Singh, 1990).
An increasing degree of market failure leads to the choice of more complex external sourcing modes. At a moderate degree of market failure, firms often turn to alliances with other organizations in order to obtain targeted capabilities (M3). Alliances help provide opportunism safeguards (Williamson, 1991) and offer coordination mechanisms for joint activity (Anand and Khanna, 2000). Although alliances may work well at a moderate degree of market failure, partnerships tend to stumble at higher levels of appropriation risks and coordination needs (Hennart, 1982; Anderson and Gatignon, 1986). In contrast, acquisitions provide the changing firm with greater long-term control, which helps protect against appropriation problems and provides greater coordination when using and creating new capabilities.

At a high degree of market failure, firms often need to undertake the cost and difficulty of acquiring other businesses in order to obtain targeted capabilities (M4). Although concerns about opportunism and bounded rationality remain even within an integrated firm (Grossman and Hart, 1986), the acquiring firm can address motivational issues by adjusting incentive systems and by establishing monitoring practices and troubleshooting systems (Zollo, 1998).

**Orienting Proposition 2.** With an increasing degree of market failure, firms that source externally will move from choosing market exchange, to alliances, to acquisitions in order to obtain targeted capabilities.

In summary, the orienting model emphasizes two factors that influence firms’ choices of internal and external sources of capabilities. First, firms with relevant capabilities, defined as capability closeness and strength, will tend to source internally, while firms that lack relevant capabilities will source externally. Second, an increasing degree of market failure will lead to the choice of more complex external sourcing modes, beginning with market exchange and continuing through alliances and acquisitions.

We note several issues concerning the orienting model. First, the model emphasizes attempts to obtain targeted capabilities but, as we noted earlier, firms sometimes do not pursue needed capabilities at all. Second, we assume that firms proceed sequentially through a decision tree, rather than considering all sourcing modes concurrently. Third, unsuccessful attempts to obtain targeted capabilities will cause problems. The discussion will expand on these points.

**THE EUROPEAN TELECOMMUNICATIONS INDUSTRY**

Data collection and analysis followed grounded theory building techniques (Glaser and Strauss, 1967). The fieldwork expanded our preliminary model and identified new issues. The approach relies strongly on inductive findings in the field, while orienting the initial investigation within a deductive framework. The inductive case method suits research that poses “how” or
“why” questions, involves complex causal links, and seeks to generate novel theory that is empirically testable (Eisenhardt, 1989). The multiple-case design permits analytic generalization and logical replication (Yin, 1981). The case study approach is especially revealing for research concerning business capabilities, because of its ability to reach the depth and breadth of managerial intentions and mechanisms related to organizational activities (Leonard-Barton, 1992; Inkpen and Beamish, 1997; Brewer and Nollen, 1998; Rouse and Daellenbach, 1999).

Data Collection

The research developed over three stages. In the first stage, we relied on open-ended interviews to gather information on the industry, the type of capabilities firms were looking for and the way they filled their capability gap. In the second stage, we conducted a series of on-site semi-directive interviews with telecom executives to refine the framework. In the third stage, we conducted a workshop with executives from several industries and interviews with telecom experts in order to confirm the emergent model. Table 1 lists the firms.

********** Table 1 about here **********

Stage 1: Exploratory interviews

We conducted eleven in-depth interviews at the early stage of our project when we were developing our orienting model to ensure that our research question: “How do firms develop new capabilities to adjust to their environment?” was relevant for managers. The format of the interviews was open-ended. We addressed the following questions: “What changes in your environment are you facing?” “What type of new competencies and skills do you need to adjust to these changes in your environment?” and “How do you intend to acquire those needed skills?” Each interviewee then discussed the modes of acquiring new capabilities that the firms used.

We had access to senior executives through an Executive Education Telecom program at a leading European business school. The interviews, which lasted for one to two hours, drew on a diverse set of managers. We interviewed people who worked for telecom incumbents such as France Télécom, British Telecom, and KPN, as well as for newcomers such as Enertel. The executives held positions in areas such as purchasing, marketing, finance, customer service, and data engineering, and in businesses such as mobile, data, and fixed lines. We also interviewed a partner at McKinsey, who had substantial expertise in the telecom industry.

We carried out the interview phase in collaboration with an MBA student who was a former McKinsey consultant and an expert in the telecom industry. She was familiar with the
telecom lexicon and could follow up on technical and regulatory issues. The first stage was crucial to refine our questions for the second stage of the data gathering process.

**Stage 2: Semi-directive interviews**

We then conducted eight on-site interviews with managers who held high-level positions in their firms. These included, among others, general managers of the ICT business, E-business, leased line business, voice over IP (Internet Protocol) business, and Innovation.

The interviews, which lasted between two and three hours, comprised three parts. In the first part, managers outlined key capabilities they needed in order to survive in the telecom industry.

In the second part, managers described how they intended to fill the resource gap and what criteria they used to choose among the different modes. Typical questions asked in this part were “How do you manage the resource gaps?” and “When do you decide to go externally rather than doing it by yourself?” With managers whose firms had been involved in recent acquisitions, we asked, “Why did you make these recent acquisitions?” “Why did your firm use acquisitions rather than internal development via an alliance or a market exchange?” and “Was it an effective way of obtaining the needed capabilities?” As managers answered these questions, we followed up with further questions concerning capability relevance and market failures.

In the third part, managers reported stresses associated with the mode they chose to develop the needed capabilities. Questions in this part included “How effective has this acquisition (or alliance, market exchange, internal development) been in building the needed skills?” and “What have been the challenges and pressures for your firm associated with this acquisition (or alliance, market exchange, internal development)?” We asked follow-up questions as they identified issues associated with a specific mode. For example, when they stressed that they were concerned with property rights issues in the context of a market exchange or alliance, we asked whether their firm had developed safeguarding mechanisms.

The on-site interviews differed substantially from the stage one interviews. Beyond the interview itself, the on-site interviews allowed a richer interaction with people at the firm. The executives introduced us to their colleagues, in order to provide corporate documents, archival data, and access to assistants for follow-up questions. For instance, when we interviewed one senior executive at a major telecom operator, we left the firm with detailed documents on their knowledge management initiatives, a set of slides from internal and external consultants that related directly to our research topic, and a list of contacts for follow-up questions.
Stage 3: Confirmatory research workshop and interviews.

After developing the emergent framework based on the exploratory and semi-directive interviews, we followed up with two forms of confirmatory extensions.

First, we conducted a research workshop with top managers from several industries to obtain confirmatory support of our framework. This workshop involved corporate development officers from five firms, including one telecom executive and four executives from other technology-related industries. The executives worked at firms as diverse as Eastman Kodak, Hoescht Marion Roussel, and the BBC. This diversity allowed us to assess whether the model applied outside the telecom sector.

In spite of this industry diversity, all group members shared a common interest in our research topic. They were attending an Executive Education program on “Managing Alliances and Strategic Partnerships”, and they were keen to participate in our research workshop. Managers who participated in the workshop had a strong interest in the topic. In the course of the program, they kept raising questions such as “When should I choose an alliance over an acquisition? When can I buy off the shelf rather than going for an acquisition?”

The five executives received the assignment as a group to provide feedback on our framework and to brainstorm about complementary influences on the choice of modes of acquiring new capabilities. This confirmatory research workshop turned out to be useful in assessing our framework and the sequence of the decision process.

Finally, we conducted two additional in-depth confirmatory interviews. The participants included a manager from Optimus (Sonae) and a telecom expert from McKinsey.

Thus, the overall research process provided a rich understanding of the orienting propositions and helped us develop an emergent model of capability sourcing. We followed an iterative approach to cross-case analysis (Miles and Huberman, 1984; Siggelkow, 2002), by assessing the information that the executives gave us concerning their experience with obtaining new capabilities, comparing their comments to the orienting propositions, and then extending the propositions as new information emerged from the interviews. We also examined academic literatures to widen generalizability. For clarity, we focus on the conclusion of the analytical process rather than present each iterative step.

Change in the European Telecom Industry

In the context of our orienting model, the European telecommunications industry takes the position as the competitive environment (S1), while the skills of telecommunications
incumbents are the existing capabilities (S2). The European telecom industry changed rapidly during the 1990s. The changes affected many aspects of the industry, including traditional network operation, digital communications, cable services, and new fiber optic networks. This meant that firms with traditional capabilities faced substantial capability gaps.

Industry deregulation brought about many changes in traditional network operation. European Union and national regulators increasingly forced incumbents to unbundle services and allow competitors to use their local transmission loops, which allowed competitive entry for fixed-line voice and data communications services.

In addition, new entrants were competing with established telecom firms to lead the industry as new computing-oriented and mobile digital services took root. Companies such as Video Networks, QSC, and KPNQwest were building their own Digital Subscriber Line (DSL) networks to compete with the incumbents. National telecom companies such as Belgacom, Deutsche Telecom, BT, and France Télécom, spurred by such competition, invested heavily in the new DSL services and rolled out other new offerings (Beardsley, Raghunath and Wilshire, 2000). Potential new technologies included UMTS (Universal Mobile Telecommunications System), which is a third generation (3G) telecommunications technology that provided mobile broadband communications at rates as high as two megabits a second – more than 100 times faster than previous mobile communications.

In the cable segment, meanwhile, telecom regulation forced incumbents in Germany, Ireland, the Netherlands, and Switzerland to separate and sell cable TV properties they controlled. Many cable operators upgraded their networks to provide two-way broadband services via cable modem and planned to introduce interactive services such as video on demand.

In the fiber backbone segment, meanwhile, many new companies began to offer pan-European and transatlantic fiber optic services. Entrants included companies such as Interoute, Hermes Europe Railtel, Level 3, KPNQwest, and Level 3. By 2000, aggregate capacity expansion plans had reached 500% a year.

Competition was tough within and across industry segments. Incumbents and entrants fought to capture economies of scale and scope by assuming cross-border leadership.

The competition forced incumbents to attempt to obtain new capabilities. In the past, European telecommunications companies viewed themselves primarily as infrastructure providers. The firms developed strong capabilities in operating traditional networks, particularly capabilities needed to operate voice transmission technologies for local and long distance
telephone services. As the battle for access infrastructure heated up, though, pure infrastructure providers ran the risk of seeing value accrue not to themselves but to content providers and aggregators, potentially relegating infrastructure providers to the role of commodity bandwidth providers (Beardsley, Raghunath, and Wilshire, 2000). To prosper, infrastructure providers needed to secure customer relationships by offering distinctive value-added services and content. The telecom companies faced challenges from database firms with much stronger information technology (IT) capabilities (Armstrong, 1998).

Of course, with the benefit of hindsight, we know that the anticipated technical and market transformation was far less extensive than the companies expected. For instance, UMTS and 3G mobile telecom firms expanded much more slowly than forecast. In addition, fiber optic network expansion far outstripped demand. Many new entrants failed and retreated from the market. Nonetheless, despite the highly publicized problems in the industry, many changes took root, as services such as DSL and cable modems began to diffuse throughout Europe. Even though new competition had been less aggressive than the industry expected, firms still needed to obtain new capabilities. Moreover, whether or not the new services ultimately succeeded, firms operating during the late 1990s and early 2000s, believed that they needed new capabilities, and had thus to decide how to obtain them.

Thus, regulatory, technical, competitive, and market transformations were affecting most aspects of telecommunications company activities at the end of the 1990s. The environmental changes led to substantial gaps between firms’ existing capabilities and capabilities that they believed they would need to prosper in the years ahead.

AN EMERGENT MODEL OF CAPABILITY SOURCING

The text contains examples and quotations from the interviews that illustrate the argument as it develops. This approach – of organizing interview information on a concept-by-concept basis – suits a situation in which qualitative research illustrates a moderate number of concepts (Hargadon and Sutton, 1997). The concept-by-concept approach contrasts with organizing information about each concept on a case-by-case basis, which suits cases in which qualitative research illustrates a small number of concepts (Brown and Eisenhardt, 1997; Galunic and Eisenhardt, 2001).

Figure 2 depicts the emergent model, which clarifies and extends the initial orienting propositions. The discussion below describes how we gained a deeper understanding of each key
element of capability sourcing modes and processes. The labels in the following sub-headings refer to elements of the emergent model.

********** Figure 2 about here **********

**Targeted Capabilities in the European Telecom Industry (A1)**

The interviews identified many targeted capabilities that the firms wanted to obtain in order to deal with the changes in the competitive environment (part A1 of the emergent model). Targeted capabilities emphasized key aspects throughout Schumpeter’s (1934) change typology, including components, products, production processes, marketing, and organization. Thus, some of the changes involved physical assets and human resources. Most strikingly, though, changes in the telecom industry entailed much more than acquiring new physical assets and individual employees. The changes also meant transforming the organizational processes the firm needed to operate in new market segments. The following quotes reflect the extensiveness of the changes.

“We have gone through a major internal restructuring, including processes, interaction with clients, and profit and loss responsibility. The major goal of this restructuring is to be more customer-oriented, more transparent, and to develop accountability.”

“We want to be a knowledge-sharing organization so that we can provide integrated products in a timely fashion.”

“In the face of increased competition, we need to be much faster at changing our core business. We are too much technology and product driven, while we need to be more customer focused.”

“Organizational challenges are recruiting, fast decision making processes, and higher customer flexibility. We need to be more customer-driven. Processes need to be defined based on customer needs and on the required delivery time.”

Accordingly, targeted capabilities tended to emphasize R&D, technical (IT), marketing (customer orientation and market knowledge), and managerial skills. For many telecom incumbents, the telecom and IT convergence was causing a drastic reshuffling of their capabilities, as the following statements illustrate.

“Our current skills are based on traditional, specialized engineering skills, while we are looking for engineers with a general view of network architecture and with broader responsibility. We also need sales and marketing people more specialized in Internet and carrier products.”

“There is a huge gap between the skills we need to deliver an integrated offering in the ICT [Information and Communications Technology] business and our current competencies. To deliver such an integrated portfolio, we need 80% IT competencies versus 20% traditional telecom competencies.”
The interviews also identified the need to change managerial capabilities, such as fostering internal entrepreneurship and managing alliances and acquisitions.

“We need to develop an entrepreneurial spirit and risk-taking attitude.”

“We need ‘horizontal competencies’: skills that are not related to specialized know-how. We need to develop a more reactive organization through a decentralized approach. In our firm, we have a culture based on consensus; we are therefore slow at making decisions.”

The bottom line, at this stage, is that the firms believed that they needed to obtain a wide variety of new capabilities. The companies needed physical and human assets, as well as an extensive set of business process capabilities. The question that interests us next is where they decided to search for the targeted capabilities.

The issue of abandoning search sometimes arose at this point (M0 in Figure 2). In a few cases, firms immediately chose not to seek new skills, before considering available sourcing modes, because they believed that it would be too difficult to obtain new skills by any means. More commonly, though, abandonment occurred only after firms considered sourcing options.

**Overcoming A Bias for Internal Search (A2)**

A common point that emerged from many interviews was that the firms often had an initial bias toward internal search (A2). The core point here is that firms’ first tendency was often to attempt to develop new capabilities internally, whether or not they possessed relevant capabilities on which to build the new skills. Only when internal development attempts failed did they turn to considering external sources.

As one person noted:

“We went for a long time for internal R&D, but we did not have these competencies.”

Notably, though, many of the executives indicated that their firms were learning through experience to overcome the internal bias and to initiate an external search when it was clear that they lacked internal competence.

Another executive explained:

“We [recognize that we] need to develop new resources to develop an integrated portfolio; we cannot do everything on our own.”

Nonetheless, several interviews suggested that overcoming internal reluctance to external sourcing was a continuing challenge.

“We have superb technical skills on the engineering side, and internal people tend to think that they should be given a chance to go on their own. We really need to break this perception barrier.”
“A lot of seniors still think that we should do everything on our own.”

Thus, the capability gap portion of the sourcing model required two elements rather than only one: identifying a capability gap (A1) and overcoming internal reluctance to consider searching outside the firm (A2).

Our discussions then turned to the next stage of the orienting model, concerning relevant capabilities. We quickly realized that capability relevance was only one of the questions that arose at this point. Reconfiguration skills and social conflict also emerged as important issues.

**Internal Drivers**

**The focal firm’s relevant capabilities (Q1a)**

Once firms initiated a decision process for new capabilities, rather than simply undertaking internal development by default, issues concerning capability relevance were common, as we expected (Q1a). Several people stressed that the first question that arose when they considered the choice between internal development versus external acquisition modes was: “How far are the targeted capabilities from our current skills?” The second question was: “How fast?” The third question was: “How costly and easy would it be to acquire those skills compared to internal training?” The choice criterion depended on whether the firm possessed capabilities that would allow them to develop needed capabilities in a timely and cost-effective way.

Many executives pointed to both dimensions of capability relevance. Capability closeness was a common theme. If targeted capabilities were close to skills that the firm already possessed, internal sourcing was often feasible. By contrast, the firms commonly searched externally when the new capabilities were far from their existing skills. For example, one person noted that their current capabilities drew from traditional, specialized engineering skills, while they were looking for engineers with a general view of network architecture. They preferred external hiring to internal training, in that case. The following quotes illustrate this point.

“Internal development tends to be slow, especially when it is far from our current skills.”

“Training internal people is easier when new skills are close to the existing skills.”

“We turn to external acquisition of skills when the needed skills are far from our current skills, and when speed is important.”

“The main issue is how to manage the resource gaps? Should we do it by ourselves or acquire other firms? One of the main criteria for deciding on acquisitions is how far is it from our current skills.”

Capability strength also emerged as an issue. Firms with skills that were far from the state of the market often preferred to search externally. Even when a firm was familiar with targeted
capabilities, reaching competitive parity was also an important factor in the sourcing decision. When a firm lacked competitive parity, external sourcing dominated internal development.

One person stated:

“We realized that we needed to reach a certain threshold of competencies before we could run effective internal development.”

In summary, the fieldwork supports our first orienting proposition. However, if possessing relevant capabilities is a necessary condition for the focal firm to develop the needed capabilities, this is not a sufficient condition. Thus, despite the intuitive and theoretical appeal of our first proposition, a firm needs to address complementary influences when it assesses its ability to develop new capabilities internally. The fieldwork emphasizes two complementary influences: the extent to which the focal firm has the ability to move and reconfigure its own capabilities (“internal reconfiguration skills”), and the extent to which the targeted capabilities conflict with the focal firm’s existing capabilities (“capability conflict”).

**Internal reconfiguration skills (Q1b)**

Several people stated that internal skills that resided within their firms were often not available to internal people. In other words, firms lacked the relevant process skills to use their own capabilities in novel ways. We label these as *internal reconfiguration skills*. Internal reconfiguration skills refers to the ability to identify and locate knowledge that resides within the firm, make the knowledge internally tradable, and replicate or recombine across the firm. Three quotes highlight this issue.

“We do have the technical capabilities but we do not have the processes. We are not fast enough at developing internal systems and processes.”

“We need to develop an organizational capability to work in a lateral/integrative way across units.”

“My nephew (7 years old) learns quicker than I do; he already knows how to play with the computer game Sim City. He knows that when he is building a city, people belong there, have to eat, need energy, and need clean air ... He combines his knowledge about the game (and the choice he makes) with other children, either physically or electronically. He grows up with the natural idea that sharing knowledge is smarter, for everybody involved. That’s good!”

Internal people commonly lacked familiarity with capabilities their sister units possessed or were in the process of developing. In some cases, the firms found it easier to map external knowledge than internal knowledge, owing to the lack of information channels. Sibling rivalry across units could also impede communication.
Making the internal knowledge tradable was a major challenge for traditional telecom operators, which have organized themselves along hierarchical functional silos. Most executives stressed that their traditional corporate culture discouraged knowledge sharing. The extent to which people were willing to share knowledge varied substantially. The more people felt they were competing against one another, the less likely they would be to share their knowledge.

“People in the commercial areas tend to be more competitive; each SBU is striving for its profit and is not ready to share information with a potential competitor. This attitude is linked to the culture of each activity. For example, we have ‘the salesman of the month’; but we do not have the ‘scientist of the month’!”

Firms that were sensitive to that issue were making efforts to develop reconfiguration skills. Various formal approaches included corporate knowledge centers, best practice databases, skill inventories, and knowledge maps. In addition, some firms were attempting to develop ways of encouraging informal knowledge sharing, through cross-functional workshops, intranet groups, and job rotation.

The following quotes reflect firms’ efforts to break the “traditional” mold.

“We have a long history of not sharing knowledge. To overcome this culture, we have developed systems of incentives to improve transversal collaboration. We need to develop a knowledge sharing culture, with project management skills, interdisciplinary teams, and integrated databases. We are very hierarchical; we need to develop more flexibility.”

“To develop an innovative and sharing knowledge culture, we have created interactive workshops, knowledge maps, skills inventories, Best Practices databases, intranet chats, and discussion groups.”

“We are developing a plan for changing skills. We proposed 6,000 early retirements; 90% accepted. As a result of the plan, 6,000 people within our organization rotated jobs, which transferred skills and knowledge.”

One company had a sophisticated knowledge management strategy. The firm developed the corporate knowledge management initiative along four main dimensions: 1) knowledge capture and access; 2) knowledge culture; 3) knowledge trading, and 4) knowledge innovation. These dimensions encompassed the three elements that we listed in the definition of internal reconfiguration skills: knowledge identification, trading, and replication/recombination. A corporate team of 300 consultants and project managers supported the firm’s knowledge initiative by spearheading cross-functional product and process development teams.

The “knowledge capture and access” project aimed at developing a company-wide discussion that was open to all employees. It contributed to the firm’s strategy by gathering new ideas for new services, by recognizing initiatives inspired clients, and then informing all its
employees about them. The firm implemented the project via corporate intranet, using it to help build an internal community.

The “knowledge culture” project aimed at creating a knowledge sharing culture, making better use of experiences and best practices and overcoming cultural differences between various units and countries. The company set up community hosting, on-line chat sessions, workshops, and databases. Training was also an important tool. At the time of our interviews, the firm had run training courses on “Professionalizing knowledge workers” (500 participants), “Knowledge culture training” (30 national and international participants), and “Masterclass knowledge management” (15 participants).

The “knowledge trading” project was implemented to diffuse experience and knowledge across units and layers within the firm, and reuse the experience in other service offerings. One goal was to cut time to market by 75%, from two years to four months. An important tool was an intranet “Knowledge Net” for team discussion and sharing best practices. Incentives were also important: to free time so that people would be willing to share their experience, and be rewarded for doing so. In other words, each consultant in the knowledge management unit had to share and report knowledge through, for example, workshops, in at least three of the firm’s 23 services. The people receiving the knowledge assigned scores to their learning and described how they might use the new knowledge. The score was part of the consultant’s annual performance evaluation.

The “knowledge innovation” project was designed to use the knowledge and experience to develop new services and sell them to other clients. To foster this recombination of knowledge, the firm dedicated resources to an inventory of the skills of each service and individual. Developing and maintaining a skills inventory helped improve the matching, on the basis of personal skills and business behavior, of consultants and project managers to specific projects. For example, all consultants were responsible for their own competence profiles via personal web pages.

The case we just presented illustrates how much effort it may require to make internal resources available and redeployable to other uses and by other units of an organization. Some firms were well aware that internal knowledge was not readily available to internal people, and that they needed to develop reconfigurations skills to use internally resident knowledge.

The presence, or lack of, such reconfiguration mechanisms influenced the choice of internal and external sourcing. Firms that believed they had successfully created reconfiguration
skills that were relevant to particular targeted capabilities, found internal development more viable. In contrast, those that lacked reconfiguration skills commonly moved on to considering external sources for new capabilities, even when they possessed internal skills that could have provided a base for internal change.

**Capability conflict (Q1c)**

A question concerning conflict also affected firms’ willingness to use internal sourcing. Most people cited various cases in which targeted capabilities conflicted with their firms’ existing practices. Conflicts commonly arose because of differences in organizational routines and individual incentives. In such cases, governing the targeted capabilities within the firm would cause friction with existing capabilities within the organization. Thus, the firm would risk weakening one set of capabilities while attempting to nurture another set of skills.

For example, some data communication activities required attracting people with compensation packages including stock options that did not fit with the collective and traditional culture of telecom operators. Attempting to develop a dual incentive system with both traditional wage and stock options in the current organization would have created conflict. Developing new capabilities could provoke resistance from employees who viewed the new efforts as threats to their interests, position, status, and access to resources. So, even though some people possessed the underlying expertise needed to develop new capabilities, pride and rigidity prevented them from adjusting their set of skills. Several quotes illustrate this point.

“*The major issue is the intellectual blinders that most engineers face as we move to intelligent networks; it is hard for most of our engineers to think beyond their circuit technology background to be able to adjust to this emerging business.*”

“If, let’s say, you have a manager who comes from the voice world and sees the data world coming; he will certainly talk to a lot of consultants, do a lot of reading, but his mindset is still somewhere else. The reason why he was a manager is that he had success in his prior voice environment, and his personal contacts are in the company, in the voice environment. This person will not be as efficient at running the data business compared to somebody who has always been in the data world, created a start up, knows the market and the players, and knows what to look for.”

In addition to individual resistance, conflicting resources could also create internal organizational stresses due to changes in resource allocation, formal structures, and distribution of key positions within the firm. For example, one executive from a major telecom operator emphasized that the boom in data traffic raised major internal political and resource allocation issues in the firm. For a long time, most research funds were devoted to the dominant activity, which was circuit technology for voice traffic, while the data traffic business (packet technology)
operated as a marginal business in a separate subsidiary at the periphery of the core business. Increasing data traffic challenged the resource allocation logic and led to fierce internal resistance from the core business. Another example in which a shift in the type of capabilities triggered organizational changes arose at a telecom operator that used to be organized by region to deliver voice telephony. Over time, the regional units built a strong power base within the firm. To provide more integrative solutions to the customer, the firm reinforced the role of business units, thereby reducing the power of the regional units. The new structure redeployed people and disrupted historical relationships, creating substantial stresses.

In many cases, capabilities conflicted within the organization, but were potentially complementary in the market, such as bundled service offerings. In such cases, the organizational conflict would interfere with attempts to generate synergies if the firm attempted to develop the new skills internally.

In other cases, conflicts arose at both the organizational and market levels, such as in product cannibalization, where capability conflicts were even fiercer. For example, one person described a case in which the firm created a unit to sell interconnection traffic, recognizing that interconnected traffic from other operators that needed delivery of their call within local loops would be an important source of revenues. The company created a separate unit for the interconnection business, rather than letting competitors, such as cable and wireless companies, develop the business. The firm established a specific sales force, with externally recruited people to sell this service. However, the sales forces pushed not only to provide delivery of the final local loop call, but also to carry the call at the earliest point because interconnection fees rose, the earlier the call entered the system. This business conflicted strongly with the rest of the organization, in which people were saying:

“Wait a minute. Are you a competitor? It means that you are taking away traffic from my current network?”

Another firm faced cannibalization and organizational conflict between sales of traditional switched network services and an opportunity to sell leased line services. Those running the switch network wanted to encourage people to use it, but some business customers had a strong preference for leased lines.

Many people raised concerns about managing conflicting resources. We observed different choices for addressing these concerns. A few firms simply abandoned capability sourcing in the face of high internal friction.
Rather than causing firms to abandon attempts to change, though, social conflict commonly led firms to consider two different locations for change. Some firms forged ahead with internal change, but chose to do so in peripheral organizational units that they could insulate from conflict with existing units. Other firms chose to undertake an external search, believing that they could overcome internal resistance if they imported capabilities from outside the firm and then undertook integration within the firm. In both cases, the firms developed targeted capabilities outside their core organizations.

Several examples illustrate the decision to create peripheral units. One company created a new firm with a global mandate for the data business. The corporation was based in a European country where Anglo-Saxon management styles did not prevail. They decided to set up the data business in the US, where it would be easier for them to attract the type of people they were looking for and to offer an attractive corporate environment and compensation package that they could not have proposed in their domestic context. In their home country, stock option plans were not available to employees, but only to top managers. Even proposing such a compensation package domestically would have created tremendous conflict with employees and unions. To help avoid conflict, the US subsidiary did not even use the name of the parent firm.

Another example arose at a traditional telecom operator that wanted to develop an e-business unit. They created a separate unit to run the new business because they recognized that it would not fit with the core division.

Another telecom operator created a separate company to develop a voice over IP business. That business required less bureaucracy, with a very different structure from the parent company. In spite of the separation, there was still substantial anxiety associated with this positioning, with people inside the new unit feeling that they were the “bastard company” and fearing that they would be a transient organization.

“We are the first incumbent to sell a voice Internet Protocol service. Firms like a large European competitor do it outside; we are developing this service at home. It is a real strategic challenge to start a new, competing voice IP service. At the same time, IP may become the basic communication of the future. We are quite independent from the rest of the company. We formed a separate company with 40 employees to develop the IP service. We are a bastard company; we are competing with our parent company and there is a risk of cannibalizing our present offerings. At the same time, if we want to make it happen, we need to cut bureaucracy, to be a fast mover. The current structure of the parent would not be appropriate. As an autonomous unit, we have been given a short time to reach profitability.”
Firms noted that setting up peripheral units through internal development often did not eliminate conflict, because it would be difficult to separate existing resources needed to operate the new business from those needed to remain in the core business. Commonly, firms turned to external sources to develop conflicting resources. For instance, most telecom incumbents that wanted to develop voice over IP businesses turned to external modes because they were unwilling to undertake internal development of capabilities that involved conflicts in knowledge base, culture, organization, and challenges to vested personnel. Searching externally can be a way of not only buying targeted capabilities, but also obtaining a critical mass of people with different skills who should, over time, be able to infuse cultural changes in the organization. One manager in the study summed up this view:

“I am emphasizing very much that, when you are buying a firm to get new services, you are buying very much a culture… You buy those people for their culture. So, actually you don’t want to integrate them into your culture, generally speaking. You want to migrate your own people to that culture. It means: 1) major reorganization for the telcos, 2) they will release part of their own people to migrate to this new service, and 3) put acquired people in key customer facing positions in your own organization.”

Intermediate Assessment: Internal Sourcing or External Search?

This brings us to an intermediate point in the emergent model. We first stressed that many companies had a bias for internal development but, through experience, firms found that they needed to consider external sources as well as internal venues for change. Once firms began to take the choice of internal versus external modes seriously, we identified three questions that they commonly posed when comparing the benefits of internal and external sourcing. The executives we spoke with suggested that internal development was most desirable when the firms possessed relevant capabilities on which to build, when the firm possessed reconfiguration skills needed to develop and integrate the new capabilities, and when the development could engender little social conflict within the existing organization (M1 in Figure 2). If a firm was weak in any one of these three dimensions, an external search choice became attractive.

This discussion leads to three propositions. Propositions 1a to 1c focus on the main effects of the three initial questions. We view the influences as tendencies that may lead to an external search choice. Proposition 1d, then, considers the combined impact of the factors, based on the argument that the joint impact of the factors will have a strong influence on internal versus external searches. We stress that these influences will not fully determine a firm’s choices. Because the influences arise out of multiple dimensions, there will be inherent
ambiguity in sourcing choices. Rather, the influences tend to make some choices more likely than others.

**Emergent Proposition 1a.** The more relevant a firm’s existing capabilities are to the targeted capabilities needed to fill a capability gap, the more likely the firm will use internal sourcing for the new capabilities.

**Emergent Proposition 1b.** The stronger a firm’s internal reconfiguration skills, the more likely the firm will use internal sourcing for the new capabilities.

**Emergent Proposition 1c.** The less social conflict that internal development will engender within a firm, the more likely the firm will use internal sourcing for the new capabilities.

**Emergent Proposition 1d.** The greater a firm’s combined assessment of weak capability relevance, weak reconfiguration skills, and high social conflict, the more likely the firm will search externally for the new capabilities.

At the same time, peripheral internal development emerged as a variant on external search in cases where firms possessed relevant capabilities and reconfiguration skills, but would face internal conflict within existing organizations. The relevance of a firm’s capabilities and the strength of its reconfiguration skills will influence the choice between external searches and peripheral internal development in such cases.

**Emergent Proposition 1e.** Firms that would face high social conflict within existing units may substitute peripheral internal development for external search if they possess highly relevant capabilities and strong reconfiguration skills.

When firms turn to external sources to obtain targeted capabilities, they need to choose among three modes: market exchange, alliance, and acquisition. The orienting model expected the degree of market failure to influence which mode they select. The discussions reinforced this prediction, while providing insights concerning the nature of market failure. In addition, three aspects of a firm’s governance skills arose as mediating issues, including skills needed to govern exchanges, alliances, and acquired businesses.

**Degree of Market Failure (Q2)**

As we expected, market failure was an important concern. When choosing among external modes, people typically raised the question: “Can I easily buy that capability on the market?” Managers favored market exchange when possible, before turning to more integrative modes that required heavier investments. Both opportunism risks and coordination needs arose in the guise of market failure issues (Q2 in Figure 2), while the discussions also noted that strategic importance and scope of change amplified market failure. Some people also noted that lack of legitimacy created a third form of market failure.
Traditional market failure issues: Opportunism and coordination

Firms commonly noted that they had to consider the chance that an external party would take advantage of them in an exchange, by appropriating technology and proprietary value. In such cases, firms were reluctant to undertake simple market exchanges with external parties, which they believed would leave them at the risk of proprietary losses. Some people noted that, when they bought technology off the shelf, they faced patent issues and problems concerning intellectual property rights. They were also afraid of not being in a position to control the intangible aspects of the technology exchange, and of becoming a hostage of the technology provider. On the other side of the exchange, technology sellers also stressed this concern, recognizing that knowledgeable buyers could rapidly capture the needed capabilities, and thereby reduce their value in future exchanges. One seller of technology we interviewed admitted that he was reluctant to give detailed manuals to buyers so that he could remain a valuable partner in the exchange.

In addition to the risk that the exchange partner would hold them up, some firms noted that there was a risk that the partner would capture some of their valuable resources if the exchange took place in a loose setting. One person stressed that there was a fear within his firm that, by providing access to their customer base, their resource provider would capture their commercial advantage, which was the value of the relationship they had with their customer. There was a perception that the partner would become a competitor when the contract expired.

As one person stated:

“In fact, some operators have very bright skills in IT, and in such cases, we are not so useful, as very quickly they can access our competencies; there is nothing we can do about it.”

Coordination needs were also a common issue. Firms were reluctant to undertake market exchanges when there was a substantial need to coordinate new capabilities with existing capabilities. Several people stressed that market exchanges did not provide learning opportunities, and they had to turn to inter-organizational modes of sourcing, such as an alliance or an acquisition, to learn from their partners. One person stressed that a market exchange was not appropriate when there was an ongoing need for the third party to learn the needed expertise. In the same vein, another person stressed that he was worried that a market exchange would limit his ability to understand the technology, notably the intangible aspects of the transfer. He noted that more integrative modes, such as an alliance or an acquisition, could provide stronger
opportunities to control the exchange and the intangible aspects associated with a capability exchange. One firm that bought a company to build its competencies in the IP networking business, stressed that the acquisition provided not only a means of acquiring IP and routing technologies, but it also taught them the ins and outs of running IP networks.

Moreover, more integrative modes helped the firms develop future capabilities. The stronger the integration of the acquired capabilities, the more likely they would become a platform for future products through more effective development, or would help the firm become a more sophisticated buyer. For instance, one company recognized that they had to buy firms in the data business, not only to acquire good technologies, but also to obtain a set of data skills, so that they could look for the right technologies and the right type of people.

“A market transaction is not appropriate when you have an ongoing need of the third party in your expertise…”

“We also need to command and understand the technology. So we need to have data business know-how in house, so that we can develop our own products.”

“We are also afraid of not controlling the intangible aspects of the technology exchange.”

**Amplification of opportunism and coordination: Strategic importance and scope of change**

Two elements emerged as factors that amplify the negative effects of opportunism and coordination-based issues associated with market exchange, and influence the choice among external sourcing modes. Many executives stressed that market failures entail high risks for their firm when the targeted capabilities were strategically important to the firm and/or involved a wide scope of change. That is, market failures involved not just features of the capabilities, but also stemmed from the firms’ objectives for using the capabilities.

*Strategically important capabilities* are those that a firm views as being part of its core business and/or provide important building blocks to future core activities. Firms were often reluctant to undertake market exchanges to obtain capabilities when they considered these capabilities as part of their core business. In part, the firms feared losing key knowledge in arms-length exchanges. In addition, executives stressed that market exchanges were not appropriate to trade core capabilities that required further coordinated development. When both partners had to keep putting resources together, alliances or acquisitions were more effective. One executive noted that a common entity led to tighter coordination between exchange partners and a common pool of resources. More integrative modes offered an iterative process of learning between the exchange partners, which was crucial for core capabilities. This iterative process was key – not
only to protect and develop the targeted capabilities, but also to consider further development or duplication of those capabilities if the collaboration process had been initially successful.

One executive noted:

“An alliance or acquisition provides you with learning opportunities, with a capacity to duplicate if you can succeed.”

Moreover, when new capabilities involved activities that were particularly central to the firm, even alliances often were too risky. Instead, acquisitions could provide the coordination and protection needed in the face of high market failures.

Another person stated:

“In order to bring the voice competencies into the data world, if you do not control the entity into which you bring that know-how, you weaken yourself. Because we will give up our core competencies, give them to our partner, and make our partner stronger. Alliances are too loose to do that. Once you have given up all you core competencies, what is your use? There is not much left.”

Conversely, when the targeted capabilities did not involve core skills, many executives preferred to obtain those capabilities through market exchanges, because they were much less expensive than integrative modes.

“When the assets I want to buy are non-core and simple – that is, transferable, where I do not need any input from the seller – I go for the simple solution, the contract, the supplier agreement.”

“When you can, go for the cheapest way, the purchase contract or one shot transaction. Do a JV or an acquisition only when it is the only solution left to you.”

The executives also noted that the risks associated with market failures increased with the **scope of change** that they were attempting to undertake. Scope of change refers to the range of capabilities and routines that a firm must revise and add in order to accomplish a desired change. Changes with broader scope involve revising linkages among many capabilities and routines, which requires substantial coordination, and often creates extensive organizational disruption. When a change has only a limited scope, meaning that it involves linkages among few capabilities, market failures tend to bear lower risks for the firm. A firm can both protect and coordinate necessary activities, so that market exchange is feasible. In contrast, when changes involve a wide scope of activities, market failure tends to increase, due to both protection and coordination needs. In the study, alliances or acquisitions were more common in such cases.

Alliances provided viable change vehicles for moderate scope changes. For example, if the focal firm needed a particular technology in a core domain that would entail only moderate
changes for the organization, the firm would first consider making an alliance rather than embarking on a costly and lengthy process of acquisition and post-acquisition integration.

In contrast, acquisitions were more common when the firm needed to make extensive changes. For example, an executive from a major telecom supplier stressed that they made acquisitions in the US to recoup lost time, gain access to a wide range of targeted capabilities, including people, technologies, and new mindsets, and build market credibility. The firm had been in the voice business for fifty years. The executive explained that they had been slow to read and understand what was happening in the data environment, and one reason why they had been so slow was that changes did not take place in their close neighborhood. The key data technologies were invented across the Atlantic, and even there, on the West coast of the US. The firm admitted that the changes caught them by surprise. During the previous three years, they had attempted to build expertise through internal development, and through alliances, but their efforts failed, as they suffered from a lack of internal capabilities and from market credibility. Their internal capabilities were too weak to act alone, but this lack of a minimum level of competencies made them an ineffective buyer as well as a dominated partner within alliances. In that context, acquisitions were crucial to reach a minimum threshold of competencies. Once the firm had used the acquisitions to develop competences across a wide scope of activities, they could consider resuming internal R&D projects.

Another person described an acquisition in the IP networking business, where his firm had lacked technical competencies, people, and general management skills. As the following quote illustrates, acquisition was a way for both the target and acquirer to gain access to a wide range of capabilities that would lead to an extensive set of changes.

“One overriding reason for merging with the target was to build competency in IP networking. The shortage in our competencies was in IP technologies, routing technologies, and the ins and outs of running IP networks. Our target was in a similar situation, but in reverse; they could supply the whole bundle of technologies and customers we needed.”

Another person from an incumbent telecom firm stressed how difficult it was for external people to make major changes to a firm’s culture, other than through an acquisition. In many cases, simply hiring new employees or forming an alliance could not be a viable alternative to an acquisition because the firm could not make changes via individuals. He stressed that telecom incumbents did not have a customer-oriented culture. Rather, the culture stressed that: “We are a telephone company; we know best” and, by and large, people with the traditional culture retained
power in the firms. He recognized that, while established telephone companies had been good at hiring external consultants, they had been weak at implementing changes that the consultants recommended. Even when they hired new people, the probability that these people would change the culture was low, as the following quote illustrates.

“I joined this firm as a marketing person and I came from the computer industry. I don’t think that I ever really broke through… I always felt like an outsider. When I was trying to do things, I always had to fight, notably with the regional managers. I was trying to move the firm from being a sort of regional network-based organization to a customer-based organization. The issue is that you have to make things work at the lower level of the organization.”

The same person brainstormed about ways of changing mindsets in order to make his firm more customer-oriented, particularly for major international customers. He stressed the role that acquisitions could play in that change process. He noted that an acquisition could help him reorganize the company from top to bottom. He recommended taking small bites by creating a separate organization for major international clients. This organization would be a home for acquired businesses that would offer new services. He then suggested that the people who joined the company through acquisitions, who, hopefully, should be more customer oriented, should be put in charge of the new organization.

**Market failures due to lack of legitimacy**

In addition to market failures stemming from opportunism and coordination concerns, several people raised issues about their ability to attract market exchange partners. Firms sometimes faced difficulties in persuading individuals to work for a firm that lacked a presence in a new market. The firms also sometimes struggled to convince leading vendors to sell them emerging technologies, because the vendors were concerned that the established companies would not be able to use the technology, and that the vendors’ reputations would suffer. In other words, a resource could be tradable for some firms, but not for others. Some resources, such as IT people, were easy to recruit to a high profile IT firm, but were reluctant to join traditional telecom operators. As one person stated:

“Although we offered high salaries, it is difficult to attract people who prefer to work in fast-moving environments.”

This concern highlights a third form of market failure, which we refer to as lack of legitimacy. When firms lacked legitimacy necessary for market exchange, they could consider alliances or acquisitions in order to gain access to people and technology. One executive stated that making a data business acquisition allowed his firm to get a head start – not only to obtain
technologies, but also to make the market aware of the firm’s presence and to “be taken seriously” in the data environment. Another person stressed that alliances could help increase a firm’s credibility in the targeted area, as the following quote illustrates:

“At the moment, we lack external credibility, which is conveyed through market credibility, image, and our position on the ranking that appears on the Internet about the most attractive firm to work for in the data teleco environment, to attract the best people and to have sellers of technologies such as high-tech gurus come to us. We hope, by our involvement in this venture fund [an alliance with other companies], that people will come to us to sell their technologies.”

In sum, market failures strongly influenced firms’ sourcing preferences. When the targeted capabilities face few market failures, firms would turn to market exchanges. As market failures increased, the firms turned first to alliances and then to acquisitions.

The discussions showed that market failures arose from multiple sources. The traditional market failure concerns of opportunism risks and coordination needs arose in all interviews. The executives noted that strategic importance and scope of change amplified the risks associated with opportunism and coordination issues. In addition, lack of legitimacy also created market failures. Strategic importance and scope of change are attributes of a firm’s objectives rather than of the specific capabilities that the firm seeks to obtain. That is, a capability that might raise equivalent protection difficulties for two firms might be more strategically important or involve greater changes for one firm than for the other, and thus market exchange entails greater risks for the firm. Similarly, lack of legitimacy is an attribute of a firm rather than of a capability, again highlighting the firm-specific nature of many market failures.

In parallel, a set of mediating factors concerning governance skills that firms needed to manage market exchanges, alliances, and acquisitions arose at this point in the decision sequence. In many ways, the governance skills mirrored the question concerning internal reconfiguration skills that we discussed earlier. These dual sets of issues – affecting both internal development and external sourcing – highlight the need to consider the presence, or lack, of different change management processes as determinants of sourcing modes.

**Mediating Factors: Governance Skills**

*Exchange governance skills (Q3a)*

Before selecting market exchange for capabilities that appeared to face low market failure, several executives noted that they first considered their firms’ skills for managing an arm’s-length exchange of new capabilities. We refer to such skills as *exchange governance skills*
(Q3a in Figure 2). Exchange governance skills are the ability to identify new capabilities, to discriminate among potential sellers, and to design a contract and monitor its implementation.

Firms varied in exchange governance ability for new capabilities. Some firms could identify and manage exchanges well. Some executives stressed that their firms devoted substantial resources to screening the environment. One person noted that the firm followed a networking strategy so that they could create a community whose members knew one another and their skills, could share knowledge, and could achieve faster innovation. In contrast, other executives noted that they sometimes faced real problems in exchanging new capabilities, often stemming from a limited ability to identify appropriate sources for seemingly simple capabilities.

In turn, governance skill differences influenced sourcing mode choices. Firms with strong exchange governance skills were comfortable with market exchanges for capabilities that faced low to moderate intrinsic market failures. Conversely, when firms lacked exchange governance skills, they often turned to alliances or acquisitions, even for capabilities that appeared to face low market failure, rather than risk exchange problems. In essence, the inability to govern exchanges created a form of market failure arising from a firm’s lack of skill, rather than from attributes of the capability. This point again highlights the fact that market failures have as strong a basis in firm characteristics as they do in characteristics of capabilities.

The degree to which a firm trusted its exchange governance skills commonly related to its familiarity with a particular class of capabilities. Several people emphasized that the more knowledgeable they were about the targeted capabilities, the more willing they were to buy through market exchange. For example, one firm wanted to buy data technology. People in that firm recognized that the more data skills they had, the more they reduced the risk of not commanding the intangible aspects of the technology. Another person emphasized that to be an effective buyer, the purchasing firm had to reach a capability threshold in the targeted area.

Alliance governance skills (Q3b)

Alliance governance skills also influenced sourcing mode choices. Alliance governance skills are the ability to manage the process of protecting and exchanging capabilities with alliance partners. The inability to manage alliances effectively was a common theme in our discussions. Some executives were reluctant to undertake alliances, even for sourcing activities that faced only moderate market failure, because their firms lacked the skills to manage the relationship. Several people considered alliances to be zero sum games, where one partner would
learn at the expense of the other. They were concerned that their firms did not possess skills
needed to protect and coordinate targeted capabilities.

“We chose an acquisition rather than an alliance because we need to control the
technology. We need to have the intellectual property rights. We also need to command
and understand the technology. So we need to have data business know-how in house, so
that we could develop our own products.”

“It is more time consuming to go through an alliance than standalone development as it
is much more based on consensus; at some point, one partner felt stronger than the other
partner, and there was some fear about sharing information.”

Executives who were highly suspicious about alliances often worked for firms with weak
alliance management skills. They were aware of their firm’s defensive attitude toward alliances,
and believed that their firms needed to develop process skills to manage them.

Firms that were uncertain about their alliance governance skills were often reluctant to
“open their doors”. These were, typically, firms with a weak experience in managing alliances.
In such cases, these firms often turned to acquisition to protect their own capabilities.

Issues about the balance of influence within alliances commonly arose during the
interviews. One executive from a major telecom supplier, that had a strong competitive position
in the voice telephony business and strong financial resources, expressed the firm’s frustration
when they created a joint venture with a partner from the data business. In spite of their business
and financial strengths, they were treated like the weaker partner and forced into an underdog
role. As a result, they had become reluctant to undertake alliances when they lacked expertise to
manage a relationship effectively.

An executive from a telecom incumbent noted that many senior managers saw alliances
more as a route to diminishing, rather than enhancing, the firm’s skills. This executive also
stressed, however, that it was possible to develop the skills to assess such risks and manage the
relationship with the partner more effectively.

Several people described initiatives their firms used to enable change via alliances. First,
they paid great attention to staffing issues. Some staffed alliances with people who were good at
listening, and who could work in a consensual way. For example, one executive noted that the
people from the US alliance partner he met were the “right people” – rather than the aggressive
American-style imposing managers, they were a listening, thinking, and participating type of
people. Another noted that their alliance partner was good at managing alliances as they put the
right people – listeners – in deputy positions, where they could manage knowledge exchange.
Second, executives stressed that it was useful to rotate people across partner firms. One mentioned that for a specific alliance, their US partner sent 100 expatriates to them, while their European partner sent 60 people, and their Asian partner also sent personnel. These expatriates helped them develop customer satisfaction policies, undertake reengineering, manage international traffic, develop forecasting skills, and initiate knowledge management projects. As a result, they were able to undertake extensive changes via the alliance.

Third, executives stressed that capability clarity helped foster cooperation among partners of the alliance. One described creating an inventory and database of people and competencies involved in the alliance. For example, in the IT area, they developed classifications for project leader, systems engineer, development, maintenance, and designer. These initiatives were crucial to enable information sharing and, again, they made alliances more feasible for acquiring new capabilities than they would have been without the alliance governance skills.

**Acquisition governance skills (Q3c)**

Finally, the interviews pointed to acquisition governance skills as important influences on mode choices. Acquisition governance skills are the ability to combine capabilities from targets and a firm’s existing businesses.

Many executives cited their firms’ lack of skills to manage acquisitions. They stressed that in order for their firms to survive and adapt rapidly to shifts in the environment, it was vital to develop those process skills of being able to incorporate new capabilities from external sources. Several cited Cisco as the benchmark of the industry in terms of acquisition best practices. The following quotes illustrate concerns regarding weak acquisition governance skills (the same firms also struggled with alliance governance).

“In terms of acquisitions, once again, we do not have the mechanisms to go out and buy something. We have the fundamental commercial and technical skills, but we lack the commercial processes to manage alliances and acquisitions. We have to acquire those skills or fail.”

“We need to develop a capability to manage alliances and acquisitions. The issue is how you bring such process skills into our people mindset.”

People frequently stressed post-acquisition integration issues. One person emphasized the issues associated with the impact of the imported skills on the firm’s existing skills. He noted that it was difficult to balance imported skills with their internal people and context. In the same vein, another person reported that, in the process of evaluating the respective advantages of the various modes of resource acquisition, the implications for internal people and potential
disruption of internal equilibrium were fundamental issues. Another mentioned that integrating IT systems had been a painful process for them, because they had a weak ability to coordinate their traditional client definitions with those of their targets.

Retaining key people at the target was also an important skill. Telecom operators in the data environment made many acquisitions to gain access to new technologies, different types of engineers, and future streams of innovations. One executive from an established telecom supplier reported that they acquired companies in the US, which did not have a finished product, but only a road map to launch the product. It was crucial to retain the core personnel of the targets, so they offered leadership positions and provided resources needed for rapid product successes in order to maintain the motivation of the engineers.

**Second Assessment: External Modes**

This stage of the discussion developed two sets of factors that affect firms’ choices of external sourcing modes, once they have ruled out internal sourcing, at least as an initial choice. The factors address characteristics of targeted capabilities and of the firms that desire the capabilities. First, market failures affect the choices. Second, firm-specific governance skills mediate the capability characteristics.

This discussion leads to the following propositions. We again stress the ambiguities that arise from multiple influences, so that one factor will not dominate in all cases.

**Emergent Proposition 2a.** With increasing degrees of market failure, whether due to opportunism, coordination, or lack of legitimacy, firms that source externally will move from choosing market exchange, to alliances, to acquisitions in order to obtain targeted capabilities.

**Emergent Proposition 2b.** Greater strategic importance and broader scope of change amplify the effects of market failures in influencing firms’ choice of alliances and acquisitions to obtain targeted capabilities.

**Emergent Proposition 2c.** A firm’s exchange, alliance, and acquisition governance skills mediate the impact of market failure on mode choice.

This brings us to another transition point. After assessing market failure and governance skills, many firms will chose an external sourcing mode. At this point in the decision process, though, firms sometimes find that they do not have a desirable choice. Barriers were common in cases where firms would have ideally undertaken alliances and acquisitions.

Barriers to alliances and acquisitions can arise for at least two reasons. First, there may simply be no suitable alliance or acquisition candidate available with the targeted skills. Second, even if a potential partner is available, a firm may lack governance skills needed for a targeted
capability that faces such high market failure that only an alliance or acquisition would help the firm address opportunism and coordination problems. When firms lacked alliance or acquisition governance skills, they sometimes decided to undertake the complicated inter-organizational modes anyway, hoping to learn governance skills along the way. Frequently, though, such choices turned out badly, as several of our earlier quotes illustrated.

When faced with insurmountable alliance or acquisition barriers, a firm has two options. First, it may abandon the project, having decided that it would be too difficult and risky to undertake via any mode. Alternatively, if the new capability is sufficiently important, the firm may revert to internal development. In this case, peripheral development again emerges as a possible internal option. As one person reported:

“In the case when we do not manage to acquire resources on labor markets or from other firms through alliances or acquisitions, we experiment internally; we experiment, fail, learn; we develop the strategy by doing by ourselves, by refining our practices within a very loose framework.”

This leads to a final proposition.

**Emergent Proposition 3.** Internal development reemerges as an alternative to external search when desirable partners are not available or when firms lack governance skills.

**DISCUSSION**

The interviews with European telecommunications executives helped us develop an emergent model of capability sourcing. The model identifies questions that may lead firms to external rather than internal sourcing. The model then describes several types of market failures and governance skills that frequently discriminate among a firm’s choice of external modes. Finally, when all else fails, a firm may return to internal development rather than simply give up.

The question of how changes affect business performance arises at this point. That is, so far, we have focused on the choices that firms make, without explicitly discussing whether their choices affected the ability to obtain new capabilities. Clearly, of course, this has been an implicit issue within the discussion. Many of the executives based their comments on experience with unsuccessful attempts that violated the emergent model, as well as on successful attempts that aligned with it. A detailed discussion of performance lies beyond the scope of this paper. However, the tenor of the interviews was very much that sourcing choices that aligned with the emergent model led to superior capability development and, in turn, to better business performance. By contrast, choices that violated the model often disrupted attempts to obtain capabilities and, in consequence, damaged business performance.
A higher-level conceptual question also arises here, which is how the emergent model aligns with existing theories of business change. Clearly, many theories touch on elements of the model. A full-scale integration of the diverse set of theories of business change is beyond the scope of this paper and, for that matter, any single paper. Nonetheless, we will summarize the relationship with several perspectives. We will then briefly outline an attempt to integrate the implications of the model with a simple framework.

**Relevant Theories**

First, the model aligns with aspects of evolutionary economics and other routine-based theories, while also moving beyond the evolutionary perspective. Evolutionary theories (e.g., Nelson and Winter, 1982; Cohen and Levinthal, 1990; Stuart and Podolny, 1996) emphasize the importance of local search, in which firms respond to competitive pressure by first looking for new capabilities that are close to their existing expertise. Similarly, organizational, ecological theories suggest that a firm’s existing routines constrain its ability to change beyond its existing competence (e.g., Hannan and Freeman, 1984). In parallel, organizational learning theorists, such as Levitt and March (1988) argue that firms face strong tensions in attempting to balance internal exploitation and external experimentation. This notion aligns with the internal bias that we found in the interviews. At the same time, though, the model extends well beyond evolutionary and ecological research, by identifying specific modes and conditions under which firms overcome their bias for local search.

Second, the model intersects with several literatures that have discussed social conflict, dating back to at least Stinchombe’s (1965) seminal work and even earlier (e.g., Coch and French, 1948). This literature stresses that firms commonly avoid changes that would create conflict (e.g., Burgelman, 1994; Szulanski, 1996; Oliver, 1997). The discontinuous innovation model, in which industry entrants commonly displace incumbents, relies heavily on this notion (Abernathy and Clark, 1985; Tushman and Anderson, 1986). Some parts of the conflict literature argue that different forms of conflict create greater reluctance for internal change (e.g., Eisenhardt and Schoonhoven, 1990; Jehn, 1997). Others note that conflict may lead firms to create peripheral units for new internal activities (e.g., Mitchell and Singh, 1992; Barnett and Carroll, 1995; Christensen and Rosenbloom, 1995), citing examples such as GM’s Saturn Corporation and Hewlett-Packard’s laser and inkjet printer businesses. However, there is little discussion in this literature of how conflict may lead a firm to undertake external sourcing, which arose as a common element in the emergent model.
Third, the model shares elements of dynamic capability theory (Teece, Pisano, and Shuen, 1997; Eisenhardt and Martin, 2000). Dynamic capability arguments focus on firm-specific change processes, suggesting that firms can develop the capability to change as well as the capability to produce goods and services (Helfat and Raubitschek, 2000; Zollo and Winter, 2002; Katila and Ahuja, 2002). The important role that internal reconfiguration skills, as well as exchange, alliance, and acquisition governance skills, play in the emergent model, parallels these arguments. At the same time, however, the model moves beyond dynamic capability arguments in identifying specific types of governance skills and linking them with particular modes of change. In other words, the model suggests that the ability to change involves a combination of change process and mode choice.

Fourth, as we discuss in the orienting model, we share market failure arguments with the transaction cost (Coase, 1937; Williamson, 1975) and knowledge-based (Penrose, 1959; Kogut and Zander, 1992; Grant, 1996; Spender, 1996) literatures. These theories have long argued that firms base internal and external sourcing choices on the degree of opportunism and coordination-based market failures that they face. We move beyond the traditional arguments, though, in three ways. First, the emergent model highlights the idea that firm-level strategic importance and scope of change may amplify capability-level market failures. Second, the emergent model highlights the idea that firm-specific governance capabilities fundamentally modify the impact of market failures, an idea that has received only limited attention in transaction cost analysis (e.g., Liebeskind, 1996; Silverman, 1999). Third, the emergent model identifies lack of legitimacy as a third form of market failure that influences mode choice.

Overall, then, the emergent model highlights issues that arise in theories of organizational inertia and business change. None of the theories, though, offers an integrated perspective that covers this decision sequence. Therefore, we attempt to pull these threads together into a simple framework that helps provide a lens for assessing firms’ attempts to change.

**Business Dynamics Theory**

The model most closely aligns with business dynamics theory (Capron and Mitchell, 2003), which seeks to understand how firms change in the face of constraints to change. Williamson (1999) argues that a theory of the firm requires five elements: behavioral assumptions, units of analysis, a description of the firm, a purpose of the firm, and efficiency criteria. Our behavioral assumptions include potential self-interest plus bounded rationality with firm-specific foresight; this assumption suggests that firms’ current capabilities will condition
their attempts to seek new capabilities. Our units of analysis are routines and capabilities. Routines, which are patterns of activity embodied in people and physical assets, tend to be tacit, co-specialized with other routines, and embedded in organizational contexts. Capabilities are therefore combinations of multiple routines. Because capabilities are only semi-decomposable into their underlying routines, they form distinct units of analysis, in addition to routines. We describe a firm as a governance structure, where governance includes coordinating the use of existing capabilities, creating new capabilities, and protecting the value of capabilities. In turn, the purpose of the firm is to economize on combined governance and production costs. Our efficiency criterion is that firms seek the best available value of current and future capabilities.

The business dynamics approach combines the protection governance emphasis of transaction cost economics (Williamson, 1999) with the coordination governance emphasis of evolutionary research (Nelson and Winter, 1982). The fundamental difference between our approach and protection perspectives is that we focus on routines and capabilities, rather than individual transactions. This ultimately leads us to emphasize firms’ coordination and creation activities in addition to their protection activities. The combined emphasis on protection, coordination, and creation credits the firm with a critical role in both enhancing the value of existing capabilities and creating new capabilities. Our focus on routines and capabilities as units of analysis brings our approach close to that of evolutionary economics, but with greater emphasis on factors that allow firms to overcome path-dependent constraints to change.

The five core assumptions of business dynamics theory underlie key elements of the emergent model. First, the assumption of firm-specific foresight gives credence to the idea that firms seek new capabilities in response to changes in their competitive environments. Second, the theory and the telecommunications executives emphasize firm capabilities as relevant units of analysis. Third, describing firms as governance structures is consistent with the emphasis in the discussions on institutional mechanisms that guide the development and exchange of capabilities within and among firms. Fourth, the assumption that the purpose of the firm is to economize on the combination of governance and production costs underlies the idea that firms assess the governance costs that different institutional failures will impose on their attempts to obtain targeted capabilities. Fifth, the efficiency criterion of achieving the best available value of current and future routines implies that firms will seek the best available internal and external modes to jointly protect, coordinate, and create capabilities.
CONCLUSION

This study examines how firms obtained new capabilities. We first developed an orienting model of sourcing choices that drew on well-established literatures. The orienting model emphasized two factors that influence firms’ choices of internal and external sources of capabilities. First, firms with relevant capabilities, defined as capability closeness and strength, will tend to source internally, while firms that lack relevant capabilities will source externally. Second, an increasing degree of market failure will lead to the choice of increasingly complex external sourcing modes, beginning with market exchange and continuing through alliances and acquisitions. To our knowledge, and despite the intuitive and theoretical appeal of these arguments, no studies have been made to examine these arguments across multiple sourcing modes.

We carried out a multifold qualitative study that included exploratory, semi-directive and confirmatory qualitative interviews in the European Telecommunications industry. Our fieldwork provided strong support for our initial model. We found that firms turned to internal, rather than external, sourcing when their existing capabilities were closely related to the targeted capabilities and when they could leverage internal strengths in the targeted capability area. When targeted capabilities were far away from their core knowledge, firms resorted to external sourcing. When choosing among external modes of sourcing, firms paid minute attention to the extent to which targeted capabilities could be easily tradable or not. As firms faced issues of appropriation and coordination, they abandoned market exchange to pursue more integrative modes such as alliances or acquisitions.

The fieldwork helped us refine the initial model by stressing complementary influences. One key complementary influence arises from the extent to which the targeted capabilities could conflict with a firm’s organization and/or products. Conflict with targeted capabilities could lead firms to turn to external sourcing, even if they could have drawn on internally available capabilities to develop the needed capabilities, or lead them to innovative organizational solutions within the firm, such as creating independent units outside the core structures. Further research could explore the issues of how to manage antagonistic capabilities within the firm.

This study also expands the work on dynamic capabilities of firms by stressing how such capabilities influence sourcing choices. The study supports the notion that a firm’s dynamic capabilities to search for new capabilities, such as internal reconfiguration skills and external governance skills, influence the choice of sourcing modes. The greater the dynamic capabilities
of the firm, the more firms can align its sourcing modes with the requirements associated with resource exchange, and avoid selecting a sourcing mode as a default option merely because it lacks the skills of governing a particular mode of sourcing choice.

A better understanding of how to obtain new capabilities has important implications for managers. Mastering and being able to combine internal and external searches can provide a source of competitive advantage, particularly in industries that face rapid and major shifts, and where firms need to rapidly realign their set of capabilities. Three aspects of this study make it especially useful in this context. First, we observed that many firms were likely to develop an inertial tendency toward internal development, and would turn to external sourcing only once they had failed internally. The implications of this study lead us to recommend that managers consider, from the outset, the various modes of sourcing modes. If managers make a determined effort to evaluate the attributes and organizational requirements associated with the resource exchange, as well as their firm’s governance skills, they could recognize that internal development is doomed to fail in some cases, and could save time and effort by turning directly to external modes. Our results draw managers’ attention to the notion that the most effective approach lies in a combination of these different sourcing modes.

Second, most managers were aware of the challenges associated with the organizational stretch brought about by conflicting resources. The high degree of managers’ awareness on this issue seems to suggest that firms that are able to achieve a balance between existing capabilities and targeted conflicting capabilities are rewarded for it.

Third, many managers were aware of their lack of skills of governing exchange within the firm and outside (or across) the firm’s boundaries. However, we noticed that firms deployed a determined effort to enhance their “internal reconfiguration skills” through various knowledge management initiatives, while they placed less emphasis on enhancing their capabilities to govern market exchange, alliances and acquisitions.

Clearly, substantial work needs to investigate how organizational elephants can learn new tricks. Much of the emphasis in recent strategy research has focused on the issue of how firms change in the face of constraints to change. We believe that the emergent model of capability sourcing in the European telecommunications industry can help advance this work.
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<td>Enertel</td>
<td>Product marketing manager</td>
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<td>France Télécom</td>
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<td>British Telecom</td>
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<td>Telecom industry expert</td>
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Figure 1: Orienting Model of Sourcing Modes for Targeted Capabilities

- **S1. Competitive environment**
- **A. Capability gap**
- **Q1. Relevant capabilities?**
  - **Yes**
  - **M1. Internal sourcing**
  - **No**
  - **Q2. Degree of market failure?**
    - **Low**
      - **M2. Market exchange**
    - ** Moderate**
      - **M3. Alliance**
    - **High**
      - **M4. Acquisition**
- **S2. Firm’s existing capabilities**
Figure 2: Emergent Model of Sourcing Modes for Targeted Capabilities

A1. Capability gap identification

A2. Internal bias?
   - No
   - Yes

Q1a. Firm has relevant capability base?
   - No
   - Yes

Q1b. Strong internal reconfiguration skill?
   - No
   - Yes

Q1c. High capability conflict?
   - No
   - Yes

External search: Which external mode?

M1. Internal search

M2. Market exchange

M3. Alliance

M4. Acquisition

Q2. Market failures?
   - Low
   - Moderate
   - High

• Opportunism & Coordination, amplified by Importance & Scope • Legitimacy

Q3a. Strong exchange governance skills?
   - No
   - Yes

Q3b. Strong alliance governance skills?
   - No
   - Yes

Q3b. Strong acquisition governance skills?
   - No
   - Yes

Mediating factors: Governance skills

M0. Abandon search

Internal experimentation

Abandon

Core

Periphery