THE IMPACT OF RELEVANT RESOURCES AND MARKET FAILURE ON FOUR
MODES OF BUSINESS CHANGE:

A CONCEPTUAL FRAMEWORK WITH EXAMPLES FROM THE CORPORATE
CLIENT SEGMENT OF THE INFORMATION COMMUNICATION TECHNOLOGY
BUSINESS

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1. INTRODUCTION

This research project studies different modes by which businesses attempt to change themselves. The motivation for the study is to learn more about how firms change, in the face of strong inertial forces that often interfere with attempts to change. Many convincing theoretical and empirical studies in organization theory, economics, and business strategy show that firms face strong social and economic inertial barriers to change (e.g., Nelson and Winter, 1982; Wernerfelt, 1984; Hannan and Freeman, 1989). Nonetheless, although many businesses do not respond successfully to changes in their competitive environments, some firms do change substantially by adjusting their set of resources over time (Capron, Dussauge, and Mitchell, 1998). Recently, researchers have begun to focus on the intersection of inertia and change, on the processes by which some firms balance their needs for reliability of current activities with their needs to reshape their business capabilities (Eisenhardt, 1989; Levinthal and March, 1993; Haveman, 1993; Amburgey and Dacin, 1994; Burgelman, 1994; Mitchell, 1994; Barnett and Carroll, 1995; Greve, 1998). We consider four modes by which firms undertake changes, including internal development, discrete resource exchange, inter-organizational alliances, and business acquisitions. We emphasize two main influences on mode choice, including resource relevance and market failure. The goal of the research is to identify systematic influences that lead managers to choose among the four modes of change.

For clarity, we will define several concepts at the outset. Our key concepts include routines, resources, change, and modes of change. Appendix 1 summarizes the concepts and definitions that we use in the paper.

In our approach, the elemental units of analysis within firms consist of routines, where routines are identifiable patterns of activity embodied in human or capital assets (Nelson and Winter, 1982; Dosi, Marengo, and Fagiolo, 1996; Winter, 1990). In a real sense, routines contain much of the knowledge of what a firm is able to accomplish (Hannan and Freeman, 1989). Routines consist of multiple related transactions that take place over time either within a firm or via interaction with external parties. Routines are often tacit, either because they are intrinsically uncodifiable or because they require the interactive participation of multiple people.

Several routines combine together to create particular resources. Resources, which we view as synonymous with the term capabilities, are stocks of knowledge, skills, financial assets, physical assets, human capital, and other tangible and intangible factors (Wernerfelt, 1984; Grant, 1991; Amit and Schoemaker, 1993). We will refer to a resource typology that includes R&D, production, marketing, managerial, and financial resources (Capron, Dussauge, and Mitchell, 1998). We will use the notion of targeted resources to refer to the resources that a firm must
obtain in order to undertake a desired change. In turn, we use the notion of relevant resources to refer to existing resources that provide the skills needed to undertake desired changes. By resource exchange, we mean obtaining resources from outside the firm. By resource reconfiguration, we mean recombining and adding to existing routines in order to create new resources.

By change, we mean substantive alteration to what a firm is able to do or how the firm undertakes its activities. Our discussion of change draws most directly on Schumpeter (1934), Nelson and Winter (1982), and Hannan and Freeman (1984). Schumpeter (1934) and Nelson and Winter (1982) argue that key business dimensions include processes, products, marketing strategy, and organizational structure. Similarly, Hannan and Freeman (1984) argue that key business dimensions include stated goals, forms of authority, core technology, and marketing strategy. In our approach, we examine business change on four dimensions: (1) development of new products, including physical goods and non-physical services; (2) development of new production processes, including new manufacturing processes and managerial ways of producing goods and services; (3) entry into new markets, including new customer segments and new geographic areas that require qualitatively different assets; and (4) creation of a new organizational structure or modification of significant parts of the existing organizational structure, such as redefining a formal chart, changing the composition of divisions or strategic business units, changing the span of control, changing hierarchical relationships, and changing the resource allocation process. Thus, changes are resource transformations that entail development of new products, new productive processes, new markets, or new organizational structures.

We define four modes of change as follows.

1. Internal development refers to the changes that a firm undertakes internally by recombining its existing resources. Examples of internal development include internal training and internal product development.

2. Discrete resource exchange refers to changes that a firm undertakes by acquiring distinct resources from outside the firm, such that the exchange encompasses a one-time event. Examples of discrete resource exchange include hiring new employees, purchasing distinct assets such as software packages or production equipment, short-term contracting for services, or one-shot technology licensing.

3. Inter-organizational alliances refer to the formation of ongoing relationships with another organizational entity, such as a firm or a university, in which the two organizations retain strategic autonomy but agree to work together for a period of time. Examples of alliances include equity and non-equity joint ventures, R&D and marketing partnerships, ongoing consulting arrangements, out-sourcing relationships, ongoing transfer of technology, and multi-party consortia.

4. Business acquisition refers to purchasing an existing commercial entity. Acquisition encompasses both acquiring entire corporations and acquiring individual businesses from ongoing multi-business corporations.

The four modes group together on several dimensions. We refer to the first mode as an internal mode of change and the latter three modes as external modes of change. The three external modes comprise two sub-classes of resource exchange, discrete resource exchange and inter-
organizational resource exchange (alliances and acquisitions). At the outset, we note that internal and external modes of change often occur in combination, because a firm may require several sets of resources with different characteristics in order to undertake a change. Similarly, the institutional environment may have multiple influences on change modes. In the propositions, we will focus on the main effects that will influence choices of particular modes. This approach is appropriate because the propositions will refer to the characteristics of the resources that firms require in order to change and the characteristics of the environments that shape the changes. When changes involve multiple resources or environments, then firms will often use multiple modes of change.

The conceptual base for this research emphasizes the resource-based view of the firm combined with an institutional logic. The resource-based view of the firm focuses on the characteristics of resources that exist within firms, emphasizing tacitness, co-specialization, and organizational embedness, which result in nonimitability (Penrose, 1959; Wernerfelt, 1984). The institutional view provides insights concerning how the social contexts that exist within firms and across their external environments influence the processes by which firms acquire and transform resources (Dimaggio and Powell, 1983; Scott, 1987). The resource-based view focuses on the content of change, while the institutional logic helps understand the constraints and enabling factors that shape what a firm changes and how it undertakes the changes (Oliver, 1997). We argue that a combination of resource-based and institutional logic will influence the modes by which firms attempt to change themselves. By taking these two perspectives into account, we parallel recent discussions of business strategy, which argue that resources and institutions intertwine to shape business activities (Barnett and Carroll, 1995; Henderson and Mitchell, 1997).

We develop propositions that address how intrinsic resource characteristics affect the mode of change and how institutional contingencies both directly affect the mode choice and moderate the relationship between resource characteristics and mode choice. Resource characteristics have two key dimensions, including resource relevance and market failure. Different resource characteristics call for different modes of change. At the same time, different internal and external institutional environments will shape the content and mode of change, by constraining some changes and enabling others. Institutional theory argues that institutions, which are established ways of doing things that cause pressures for social conformity, shape organizations’ actions, such that firms tend to converge on key dimensions or, at least, undertake similar responses to dissimilar stimuli (Oliver, 1997). Internal institutions include factors such as path dependence, prior experience with change, and resistance to organizational disruption. External institutions include factors such as industry structure, inter-organizational networks, and social laws and norms. Thus, the propositions will address the intertwined influences of resources and institutional environments on modes of business change.

Table 1 reviews our basic conceptual assumptions. Williamson (1991) argues that a theory of the firm must consist of five conceptual elements, including behavioural assumptions, units of analysis, description of the firm, purpose of the firm, and efficiency criteria. We take what Williamson refers to as a competence view of business organization, which emphasizes the need for firms to develop resources, in contrast to a more restricted governance approach that emphasizes protecting the value of assets. Our behavioural assumptions are those of bounded rationality, potential opportunism, and firm-specific foresight, which together lead to a need for
firms to develop mechanisms to protect the value of their resources. Our fundamental unit of analysis is the routine, which is the underlying element of resources. Use of resources creates value for the firm, with differential resource distribution across firms creating differential cost structures. As a result, production costs are endogenous outcomes of firm-specific resources. We describe a firm as a structure for governing routines and resources, where governance in our competence view includes coordination, creation, and protection. The purpose of the firm is to economize on the sum of production costs and governance costs, where governance costs include coordination, creation, and protection of routines and resources. Our efficiency criterion is of the relative efficiency of current and future use of routines, by which we mean that a firm seeks the best available mechanisms for jointly protecting and creating routines. Our approach is quite similar to transaction cost economics, with the fundamental difference being that we focus on routines rather than individual transactions. In turn, this leads us to emphasize three governance roles, including coordination of the use of current resources, creation of new resources, and protection of the value of resources. Our focus on routines as the fundamental unit brings our approach close to that of evolutionary economics (Nelson and Winter, 1982). Coriate and Dosi (1998), for instance, describe a firm as “a particular set of routines that can be traced back to the co-evolution between corporate patterns of knowledge distribution and mechanisms of coordination and governance”. The primary difference between our approach and evolutionary economics is that we are attempting to develop an understanding of why firms are able to change despite the presence of substantial path-dependent inertia.

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

The behavioural assumption of constrained foresight, which we noted above, has immediate implications for our discussion of business change. We assume that businesses frequently recognize the need to reconfigure their resources, whether by obtaining new resources or by employing existing excess resources in new uses. Businesses often must obtain new resources in order to optimize existing operations and respond to changes in the competitive environment (Caves, 1982; Teece, 1982). Firms also often have opportunities to grow by employing existing excess resources in new business applications (Penrose, 1959; Dierickx and Cool, 1989). We assume that firms are aware of their need for change and initiate a search process for new resources that would be viable in the prevailing environment. We refer to firms that have initiated a search process for new resources as changing firms. Such searches may arise at many levels of firm performance. Many firms engage in a search for new markets, products, productive processes or structure when their current performance is below their aspiration level (Nelson and Winter, 1982). Although some sort of search response to adversity is common, firms can also undertake a search process when they perform well and can devote slack resources to experiment with changes (Cyert and March; 1963; Levinthal and March, 1981; see Killaly, 1998). In reality, many factors influence whether a firm attempts to change, including dimensions such as environmental pressures, internal pressures, corporate governance structure, and firm change experience. We recognize that the initiation of the search under conditions of adversity has implications for the quantity and quality of the resources that may be devoted to it. Addressing the initiation of search and relating initiation to the likelihood of persistence or change of firm resources, however, is beyond the scope of this paper.
The paper proceeds as follows. Section 2 develops several sets of propositions and hypotheses, concerning internal and external modes of change, discrete and inter-organizational external modes, and alliances and acquisitions. Section 3 then outlines the results of a series of interviews that we undertook with managers of European telecommunications firms in which we explored the issues that we raise in the theory section. Section 4 concludes the paper.

2. MODES OF BUSINESS CHANGE

Figure 1 depicts our general model of factors that influence modes of change, while Table 2 summarizes the predictions that we develop in the following sections. The following sections describe the relationships that arise within the model and propositions.

2.1. Internal Versus External Modes Of Change

The first distinction in Figure 1 arises between the choice between internal development and external modes of change. Recall that internal development refers to changes that a firm undertakes internally by recombining its existing resources, while external modes include discrete resource exchange, alliances, and acquisitions. Firms may use either internal development or external modes to obtain resources needed for a change. We first develop an overarching proposition concerning the impact of resource relevance on the choice of mode.

In face of a need for change, firms evaluate the magnitude of change in comparison with their existing resources. Firms will tend to undertake internal development when they estimate that their current resources are highly relevant to the targeted changes. By relevance, as we noted earlier, we mean that existing resources within the changing firm provide the skills needed to undertake the changes. As we will note below, resource relevance contains several routine-related dimensions of resource endowments. For the moment, we will concentrate on the overall concept of relevance and then develop hypotheses concerning the different dimensions of relevance.

The notion of relevance derives from Nelson and Winter’s (1982) idea of local search and Cohen and Levinthal’s (1990) idea of absorptive capacity. Search is local in the sense that the probability distribution of what the firm finds is concentrated on resources close to current resources (Nelson and Winter, 1982: 211). Nelson and Winter argue that firms prefer to undertake local search when they decide to change, so long as they anticipate that they possess the resources needed to change successfully. Similarly, Cohen and Levinthal (1990) argue that firms tend to undertake internal changes that build on their existing absorptive capacity, which is a business’s’ ability to evaluate and utilize particular knowledge. Several related arguments concerning operating routines (Cyert and March, 1963; Hannan and Freeman, 1989) and path dependent learning (Levitt and March, 1988) lead to a similar conclusion. Focusing on innovation, Dosi (1982) points out that businesses tend to develop new resources in areas closely related to their existing technological resources. Teece (1986) argues that inheritance of past
routines implies that previous activities tightly constrain opportunities for learning, so that a firm is most likely to develop new resources in areas where it already has prior knowledge.

The reverse side of the relevance argument is that firms will tend to turn to external modes when their existing resources are insufficiently relevant to the resources needed for a change. Many organizational theorists argue that businesses face substantial constraints to internal development. Nelson and Winter (1982) stress that a firm's irreversible investments and limited range of operating routines constrain its ability to develop and use resources within the firm. They further note, though, that firms sometimes engage in non-local search (Nelson and Winter, 1982: 216), particularly if the firms lack needed internal resources. An extension of this line of logic is that the firm will tend to use different modes of change for local and external search.

We will mention two issues concerning external modes of change at this point. First, the organizational change literature tends to emphasize the conclusion that firms are often reluctant to undertake substantial changes, arguing that firms are less likely to undertake changes that require resources substantially different from their existing resources. Cyert and March (1963) and Hannan and Freeman (1977) note that businesses’ routines tend to create bounded rationality in organizational decision-making, for instance, while Levitt and March (1988) and Levinthal (1994) argue that the self-reinforcing nature of the search process can lead businesses to reduce or cease their search activity despite the presence of new opportunities. While we agree with the proposition that firms become less likely to change in such circumstances, we also observe that many firms do attempt to make changes that require new resources. Rather than undertake such changes via internal development, though, firms commonly turn to external sources either alone or in combination with major internal reconfigurations. Therefore, our proposition will focus on the mode of change that firms undertake, rather than the likelihood that firms will change.

A second issue concerning external modes of change is that discussions of change sometimes view internal and external search as sequential processes, in which firms first undertake local search and only later turn to external search if the local search fails. By contrast with such an argument, we stress that firms often can make an immediate choice between internal and external search. In this view, we draw on Nelson and Winter (1982), who argue that firms find it difficult to conduct local search and external search at the same time. They note further, though, that external search may substitute for internal search if firms lack needed internal resources. Pushing this line of thinking further, we argue that, from the outset, firms can recognize that internal search will be inadequate if their existing resources are not relevant to the needed changes.

**Proposition 1:** The greater the relevance of a changing firm’s existing resources to the targeted resources, the more likely the firm will use internal development rather than external modes to undertake a change.

We now turn to further examination of the notion of relevance. We use several streams of literature in which routines are central concepts, including the resource-based view of the firm, evolutionary theory, network theory, and the recombination literature to investigate influences of resource characteristics on the choice between internal development and external modes.
The central premise of the resource-based view of the firm is that firms obtain advantages from their endowments of valuable resources that are difficult to replicate, but must change those resources if they wish to maintain their advantages. Theorists have long recognized that there are intrinsic differences among businesses that compete in the same industries (e.g., Selznick, 1957; Penrose, 1959; Chandler, 1962; Ansoff, 1965; Andrews, 1977; Hofer and Schendel, 1978). More recently, strategy researchers have begun to develop the theoretical implications of viewing firms as unique collections of resources used to compete in markets. This work is becoming known as the resource-based view of the firm (Rumelt, 1983; Wernerfelt, 1984). A central argument of this view is that resources are difficult to imitate, which is the source of their competitive advantage (Lippman and Rumelt, 1982; Barney, 1986; Winter, 1987; Conner, 1991). Moreover, not only are resources difficult for other firms to imitate, they are difficult for the possessing firm to change.

The resource imitation and change difficulties arise because resources tend to be tacit, co-specialized with other resources, and embedded in organizational contexts (Nelson and Winter, 1977; Teece, 1986; Galunic and Rodan, 1998). At an underlying level, the common source of a resource’s tacitness, co-specialization, and organizational embeddedness stems from the routines that make up the resources. The tacitness property of resources stems from the degree of tacitness of the resource’s underlying routines. Resource co-specialization arises when two resources share a subset of underlying routines. Organizational embeddeness arises when multiple resources share subsets of underlying routines.

We will consider seven routine-based factors arise from a firm’s endowment of current resources that help a firm over-come the change difficulties. These endowment factors include resource closeness, resource strength, mode experience, internal resource linkages and internal reconfiguration routines, external resource linkages and importation reconfiguration routines, resource conflict, and scope of change.

We first consider resource closeness and resource strength. By resource closeness, we mean the extent to which two resources share the same routines. In this sense, close resources have a similar underlying logic (Henderson and Clark, 1990). Resource strength is the degree to which the routines that make up a firm’s resources suit the targeted resource when compared to other organizations’ resources. The notions of closeness and strength will tend to vary with the scope of a needed change, where the scope of change includes both the breadth and depth of change. Breadth of change is the number of dimensions of change, while depth of change is the magnitude of qualitative changes made within an individual dimension of change.

The closeness between a firm’s existing resources and a targeted resource, that is, the degree to which the targeted resources will consist of routines that exist within a changing firm’s existing set of resources, will influence whether a firm uses internal development or external modes to obtain new resources. Galunic and Rodan (1998) argue that the likelihood that firms will use internal reconfiguration of resources to create new resources varies with the degree of tacitness, context specificity, and dispersion within the firm of the knowledge. Therefore, a narrow gap between the targeted resources and the existing resources will both increase the likelihood of novel resource reconfiguration and will decrease the costs of implementation. Conversely, when the gap between the targeted resources and the existing resources are high, we expect that the
changing firm will be more inclined to resort to external modes in order to avoid reconfiguration costs. Reconfiguration costs include detection costs and implementation costs. The costs implicitly encompass the opportunity costs associated with the time lag necessary to develop unfamiliar resources. We will return to the issue of time pressure more explicitly later in the paper.

**Hypothesis 1.1:** The closer the targeted resources are to a changing firm’s existing resources, the more likely the firm will use internal development rather than external modes to undertake a change.

We expect internal development to take place not only in the presence of resource closeness but also if the resources that the changing firm will use to create the targeted resource are particularly strong. A changing firm has greater incentives to develop resources internally when the firm has a strong competitive position in the targeted resource area. Conversely, firms with weak resources will tend to use external modes. In some cases, the firms will be able to obtain discrete external resources by hiring new employees or purchasing new assets. In other cases, though, a changing firm will need to turn to the inter-organizational external modes of acquisitions and alliances. The acquisitions and alliances literatures show that managers will often search for targets or allies with strong resources that complement the acquiring firm’s weaknesses, planning to redeploy the stronger resources from the target (Capron, Dussauge, and Mitchell, 1998) or use the ally’s strength (Inkpen and Beamish, 1997; Dussauge, Garrette, and Mitchell, 1999). In the foreign direct investment literature, data on foreign direct investment shows that firms with strong technological capabilities have less need to buy or ally with existing firms and are more likely to enter foreign markets through greenfield ventures (Hennart and Park, 1993). That is, greater resource strength relative to local firms favors the choice of internally developed greenfield investment rather than joint venture or acquisition. Alternatively, firms with few technological capabilities tend to obtain technology by acquiring innovative firms (Granstrand and Sjolander, 1990).

In a later section of the paper, we discriminate between factors that lead to discrete exchange, alliances, and acquisitions. For the moment, though, we focus on the distinction between internal and external modes of change. Overall, the resource-base view of the firm stresses the distinction between exploiting existing resources and exploring new resources (March, 1991; Koza and Lewin, 1998). When firms seek out resources that can benefit from their superior organizational or technical resources, they often prefer internal development rather than external modes of change. Conversely, when firms seek out resources in areas in which they do not possess advantages, they will tend to turn to external modes.

**Hypothesis 1.2:** The stronger a changing firm’s resources in the targeted resource area, the more likely the firm will use internal development rather than external modes to undertake a change.

We now consider three sets of factors concerning linkages among a firm’s resources and the firm’s ability to manage such linkages. These factors include mode experience, internal resource linkages and internal reconfiguration routines, plus external resource linkages and importation reconfiguration routines.
The mode experience factor arises from path dependency. The idea of path dependency is common to many literatures, ranging from institutional economics (Arthur, Ermoliev, and Kaniyovski, 1987), to organization ecology (Hannan and Freeman, 1989), to organizational learning (March, 1991). The basic idea is that a firm will tend to accumulate a particular type of experience that will create routines that in turn shape its subsequent decisions. The underlying issue is clearly expressed in structural inertia theory, which views organizations as relatively inflexible organizations in which change is both difficult and hazardous since change disrupts internal and external routines (Hannan and Freeman, 1984). At the same time, though, organizational inertia has twin implications for change. Amburgey, Kelly and Barnett (1993: 54) note that “When organizations adhere to current operating routines and resist change we can say that they exhibit inertia, but another form of inertia (momentum) results when organizations develop modification routines and change operations through processes over time”.

For us, the key path dependent routines are those that arise through experience with a particular mode of change. By mode experience, we mean the extent to which the changing firm has engaged in a mode of change in the past, where extent includes the frequency of experience, how much the firm has invested, and the success of prior experience. Each of these elements of experience will lead the firm to develop and retain relevant routines. Firms that frequently undertake a particular mode will develop routines that suit that mode. Similarly, firms that undertake substantial financial and organizational investment in a particular mode will develop routines that suit the mode. Moreover, firms that view their past experiences with a particular mode as successful will tend to retain the routines that the activity create, while firms that view the experience as unsuccessful will tend to pare away the routines that result from the experience. Thus, firms will tend to repeat modes of change that they have undertaken in the past.

Mode experience can affect the purposes for which a firm uses a mode, as well as influencing the repetitive use of a mode of change. Amburgey, Kelly and Barnett (1993) argue that the more experience an organization has with a particular type of change, the more likely that the change will be seen as a solution to a broader set of problems. For example, firms with a frequent use of internal development may be more inclined to using this mode of change to develop resources that are significantly distant from their existing resources. Moreover, the increased competence in making a particular mode of change lowers the marginal cost of undertaking a change. At this point, we focus on internal development, while we will consider external modes later in the paper.

Hypothesis 1.3a. The greater a changing firm’s internal development mode experience, the more likely the firm will use internal development of resources rather than external modes to undertake a change.

It is important at this point to consider limits to the path dependency argument. Business theorists sometimes risk over-emphasizing the extent to which a firm’s past experience guides its current actions. While the past undoubtedly conditions the future, firms often do undertake new types of activities. In our context, firms that undertake extensive internal development will eventually exhaust the resource recombination opportunities within the firm. As a result, the firm
will need to turn to external opportunities to obtain new resources that it requires in order to create greater diversity of resource recombination opportunities. For example, Barkema and Vermeulen (1998) argue that ongoing exploitation of a firm’s knowledge base through internal start-up eventually makes a firm simple and inert, while, in contrast, business acquisitions broaden a firm’s knowledge base and decrease inertia. Acquisitions infuse the organization with new people, mental maps, routines and processes (Capron, Mitchell, and Swaminathan; 1998; Ahuja and Katila, 1998). Similarly, the external modes of alliances and discrete resource exchange provide means of obtaining variety. Thus, we expect a nonmonotonic relationship between mode experience and mode choice. We expect that past some point of accumulated experience with a particular mode, firms will become more likely to turn to alternative modes in order to generate greater variety of routines within the firm. Only if the routine variety remerges will path dependence return as a dominant influence.

**Hypothesis 1.3b. Past some point of internal development experience, the greater a changing firm’s experience with internal development of resources, the more likely the changing firm will use external modes to undertake a change.**

Now consider internal resource linkages and internal reconfiguration routines. The first hypotheses emphasize preferences for internal development for cases that appear as primarily incremental changes, in which firms tend to preserve their existing routines. This approach is consistent with many arguments concerning organizational inertia. In this line of thinking, firms usually confines internal development to incremental refinements and extensions of resources, without altering their underlying logics or the links between them (Henderson and Clark, 1990:11).

On the other hand, an emerging stream of literature, the recombination literature (e.g., Eisenhardt, 1989; Henderson and Clark, 1990; Galunic and Rodan, 1998) argues that firm can undertake non-incremental Schumpeterian innovation internally by recombining resources in novel ways. Recombination innovation tends to be radical and disruptive in nature (Schumpeter, 1934). The resource recombination literature challenges simple organizational inertia arguments and explores the antecedents of the likelihood of such recombination. In others words, the literature examines how much a firm can change by using its existing set of resources as a portfolio of routines. This is an intriguing argument, because it suggests that local search within the existing range of a firm’s activities can sometimes lead to non-incremental innovation.

The recombination literature notably emphasizes the role of internal linkages among people and resources within the firm in influencing the extent of internal reconfiguration. “It is in the shaping of a creative context amenable to the identification and implementation of novel resource combinations that the firms play an essential role” (Galunic and Rodan, 1998). In this respect, many factors may contribute to developing entrepreneurial activities within a firm, such as buoyancy of internal labor markets, resource allocation processes, tolerance for experiments, management by committee, transversal mechanisms, integrative capabilities (Henderson and Cockburn, 1994), delineation of competencies (Cohen and Levinthal, 1990; Kogut and Zander, 1992), information processing linkages (Galbraith, 1973), multi-divisional form (Amburgey and Dacin, 1994; and inter-group linkages (Nadler and Tushman, 1997). In sum, these factors focus on the linkages among routines within the organization.
This discussion gives rise to the concept of internal resource linkages, by which we mean the degree to which a firm’s resources share common routines. In practice, internal resource linkages can take many forms, such as informal personal ties, formal reporting relationships, and common business systems. When a firm enjoys substantial resources linkages across resources in many areas of the firm, it will have many opportunities for internal development. By contrast, when such linkages are rare, the firm will have greater need to turn to external modes if they wish to attempt to change. We will later turn to a discussion of external linkages.

Hypothesis 1.4a: The more internal resource linkages there are among a changing firm’s existing resources, the more likely the firm will use internal development of resources rather than external modes to undertake a change.

Internal resource linkages in and of themselves are not sufficient to achieve reconfiguration. In addition, firm must have the change process capability for internal resource reconfiguration. By change process capabilities, we mean the ability of the firm to manage the process of resource reconfiguration, independent of the nature of the resources. We will use the term internal reconfiguration routines to mean the systems that a firm has created that allow it to recombine and add to existing routines in order to create new resources. Firm’s vary in the degree to which they are able to undertake such internal innovation (Galunic and Eisenhardt, 1996). In part, the strength of firm’s reconfiguration routines will co-vary with a firm’s mode experience. In addition, though, some firms simply develop greater or lesser strengths, independent of their cumulative experience. Firms with superior internal resource reconfiguration skills will tend to emphasize internal development.

Hypothesis 1.4b. The stronger a changing firm’s internal reconfiguration routines, the more likely the firm will use internal development of resources rather than external modes to undertake a change.

Next consider external resource linkages and importation reconfiguration routines. By external resource linkages, we mean the direct and indirect linkages of a given firm with other organizations and people, such that the linkages function as inter-organizational routines. External resource linkages derive from a firm’s position in an external community of inter-organizational and inter-personal networks.

Firms with many linkages to other organizations and people will tend to have access to substantial elements of external resources. External resource linkages provide better access to resources and may reduce the risk of opportunism as familiarity breeds trust in external parties (Ahuja, 1998). Uzzi (1996) found that external resource linkages help create trust, enhance exchanging fine-grained information and joint problem solving, and facilitate the exchanges of resources that are difficult to value and transfer via market ties. Network theory suggests that external resource linkages allow a firm to use relationships that provide reciprocity to take a longer run view of economic development shifts actors’ motivations away from the pursuit of immediate economic gains toward the enrichment of future activities (Powell, 1992). The set of external resource linkages includes both the overall set of linkages and specific linkages that span structural holes. The overall set of linkages includes direct relationships with other
organizations, as well as indirect relationships with partners’ allies. Structural holes are gaps between networks of relationships (Burt, 1992). Firms that span structural holes have relationships with at least one organization in networks that do not otherwise intersect. A larger overall set of linkages provides greater access to external resources. In addition, beyond the simple advantages of multiple relationships, spanning structural holes provides access to a more diverse set of resources than competitors. Although the joint effect of many linkages and spanning structural holes may lead to information loss (Ahuja, 1998), both forms of linkages provide access to external resources that a firm may want to use as it attempts to change. Sutton and Hargadon (1996) argue the external resource linkages enhance the ability of firm to function as a knowledge broker. External resource linkages help a firm obtain tacit information from partners. Conversely, firms with few external resource linkages will tend to be more inwardly-focused.

**Hypothesis 1.5a:** The more external resource linkages that a changing firm has with other organizations, the less likely the firm will undertake internal development of resources rather than external modes to undertake a change.

Just as the strength of internal resource reconfiguration routines varies by firm, so will the strength of importation reconfiguration routines. By importation reconfiguration routines, we mean the systems that a firm has created that allow it import resources from external sources and then recombine them with existing routines in order to create new resources. Again, in part, firm’s the strength of firm’s importation reconfiguration routines will co-vary with a firm’s mode experience. In addition, though, some firms simply develop greater or lesser strengths, independent of their cumulative experience. Firms with superior resource importation skills will tend to emphasize external modes.

**Hypothesis 1.5b.** The stronger a changing firm’s importation reconfiguration routines, the more likely the firm will use external modes rather than internal development of resources to undertake a change.

We next turn to resource conflict. By resource conflict, we mean the degree to which the routines that underlie a firm’s existing resources and the targeted resources are incompatible with each other. Incompatibilities can arise for many reasons, broadly encompassing disruption of internal routines and disruption of inter-organizational routines.

From an internal standpoint, prevailing routines act as a truce in intra-organizational conflict (Nelson and Winter, 1982: 107), and attempts to change routines often provoke a renewal of the conflict, which is destructive to the participants and to the organization as a whole. The fear of breaking the truce is in general a powerful force tending to hold organizations on the path of relatively inflexible routines. Structural inertia theorists recognize that substantial changes may take place within an organization, but that extensive organizational change may lead to organizational failure (Amburgey, Kelly and Barnett, 1993). Substantial changes imply extensive other changes in routines throughout the rest of the organization. Such extensive changes will be particularly disruptive when they involve conflicting routines.
When possible, a firm will try to target resources with features that will allow its existing routines to function smoothly, in order to maintain the truce that existing routines represent. Thus, the social context in which resource transformation takes play greatly influences the social acceptance of the targeted resources (Oliver, 1997). Ginsberg (1994:158) notes that “strong institutional pressures abide in the evaluation of current resource allocations and in hindering acceptance of resource deployments”. Oliver (1997) argues that a firm’s historical cultural and political context, along with the psychological costs associated with organizational change, can constrain resource redeployment. At the individual level, employees may have to learn new skills, and power may shift to new individuals and groups within the organization subsequent to resource redeployment. Both vulnerable employees and powerful vested interests are likely to oppose such change. The presence of cognitive sunk costs will lead managers to reinforce the existing resource position and make resource redeployment less likely. At the organizational level, potential violation of corporate traditions, norms or culture may dampen resource redeployment. Resources that firms have accumulated over a long period acquire a taken for granted character within a firm that makes them resistant to resource changes (Oliver, 1997). These traditional core competencies could potentially turn into core rigidities (Leonard-Barton, 1992) and competency traps (Levitt and March, 1988; Barnett, Greve and Park, 1994).

From an external standpoint, inter-organizational routines arise as a result of boundary-spanning linkages with other firms and organizations. Many theorists have argued that firms become embedded in a set of inter-organizational relationships that create resistance to change (Hannan and Freeman, 1984; Granovetter, 1985; Burt, 1992; Amburgey, Kelly, and Barnett, 1993; Singh and Mitchell, 1996). This implies that, in order to preserve their routines, people in place within the firms are more likely to develop internally resources that fit the current systems, that is, resource that tend not too be too disruptive. In sum, internal development is more likely to maintain an intraorganizational truce as it builds incrementally on existing routines, and is more appropriate to develop resources that reinforce the existing systems than disrupt them.

Internal development of resources that build on new routines meets institutional barriers. Conversely, when routines require significant change, and particularly if the changes will conflict with the existing routines, the use of external modes of resource acquisition will tend to be more appropriate. The core reason is that the firm will have less need of immediately attempting to adjust existing routines in the face of substantial resistance. Instead, the firm can attempt to obtain resources that consist of new routines from outside the firm and only then undertake the inevitable process of adjusting existing resources. This argument closely parallels Abernathy and Clark (1985) and Tushman and Anderson’s (1986) notion of competence destruction, which arises when changes will tend to reduce the value of existing resources. The starting point argument concerning competence destruction is that firms will tend to avoid changes that involve substantial competence destruction. An extension of the argument, though, is that the presence of competence destruction will influence the mode of change of firms that attempt to change despite the potential for competence destruction. As we noted above, most often firms will seek externally in such cases, rather than undertake the immediate risk of attempting to change existing routines.
Hypothesis 1.6a: The more a changing firm’s existing resources will conflict with targeted resources, the less likely the firm will use internal development of resources rather than external modes to undertake a change.

Notwithstanding the previous prediction, firms do sometimes choose to use internal development of resources that will conflict with existing resources, because external sources may be inadequate. A further prediction, then, addresses the organizational choices that the firms will tend to make for such development efforts. Hannan and Freeman’s (1984) structural inertia argument about the deleterious consequences of change relies mainly on notions about the process of change per se, that change disrupts routines, undermines relationships, and requires learning. Barnett and Carroll (1995) posit that core changes, even if disruptive and deleterious, do not necessarily generate equal strength effect in all settings, because firms can try to attenuate the disruptive strength of a core change process. They note that “For example, when an organization attempts to make a radical change in technological and marketing strategy by creating a new decentralized and semi-autonomous subunit (for example, GM and Saturn), the process effects should be less than when such a reorientation entails reorienting an existing structure (Barnett and Carroll, 1995: 233). Similarly, Burgelman (1991: 250) notes that “The organization may, within resource constraints, rationally tolerate autonomous strategic initiatives because it offers, as the Intel data suggest, opportunities to explore and extend the boundaries of its capabilities set, to engage new environmental niches in which environmental forces are as yet not as strong, to help the organization enter new niches that have been already opened up by others and which might eventually pose a threat to the current strategy, or to learn about future potential variations in markets and technologies.”

In sum, if firms need to conduct internal development of core resources that conflict with existing resources, firms will be inclined to avoid major disruption at least during the earlier part of the process, and will develop an organizational structure that they separate from the existing structure. In such cases, the firm will create a semi-autonomous subunit to develop the targeted resources. By semi-autonomous subunit, we mean a business unit that the firm owns but operates largely independently of other business units.

Hypothesis 1.6b: The more a changing firm’s existing resources will conflict with targeted resources in cases for which the firm uses internal development to undertake a change the more likely the firm will create a semi-autonomous subunit to develop the targeted resources.

The process of establishing a semi-autonomous subunit has intriguing implications for continued evolution of the firm. Once the firm gains experience with the new resources, it has several options. If the new subunit fails, the firm may shut down the unit, with minimal damage to other units. If the new subunit succeeds, the firm can continue to maintain autonomy of the new unit, but this separation risks fragmentation and conglomeration problems. If the new resources turn out to be particularly important for the firm, the firm may choose to reorient the corporation around the new unit and de-emphasize old units, such as Intel did with its new CPU businesses and old DRAM activities (Burgelman, 1991). Alternatively, the firm may choose to integrate the activities of the new unit with other units and diffuse the new skills through the company, such as General Motors is now attempting to accomplish with the resources that its Saturn subsidiary
Finally, if the new subunit turns out to have substantial conflict with the firm’s existing resources, and if the existing resources remain the firm’s primary focus, the firm may sell the unit.

Finally, we turn to the scope of change. By scope of change, we mean the extent to which a change affects several change dimensions. Recall that we earlier defined business change in terms of four dimensions: new products, new productive processes, new markets, or new organizational structures. Within the concept of scope of change, we include breadth (number of dimensions of business change) and depth (magnitude of qualitative changes made within an individual dimension of change). As the scope of a change increases, firm become increasingly unlikely to possess all needed routines.

**Hypothesis 1.7. The greater the scope of change, the more likely a changing firm will use external modes of change.**

In summary, proposition 1 states that the greater the relevance of a changing firm’s existing resources to the targeted resources, the more likely the firm will use internal development rather than external modes to undertake a change. We have identified several elements of relevant resources, including resource closeness, resource strength, mode experience, internal and external resource linkages and reconfiguration routines, resource conflict, and scope of change. A critical role for routines as fundamental units of analysis underlies each of these elements. We address several additional contextual factors at the end of the propositions section.

We now turn to factors that will influence the choice of external modes of change. We examine three external modes: discrete resource exchange, alliances, and business acquisitions. The following section discriminates between discrete exchange and the two inter-organizational modes, alliances and acquisitions. The subsequent section then addresses differentiating factors for alliances and acquisitions.

**2.2. External Market Versus Alliances And Acquisitions**

The second distinction in figure 1 deals with the choice between discrete resource exchange and inter-organizational modes of change. Everything else being equal, firms will often prefer discrete resource exchange to inter-organizational modes simply because discrete exchanges tend to be less costly, as they involve only the targeted resources and avoid governance costs and redeployment costs for excess resources associated with alliances and acquisitions. Nonetheless, firms often undertake even highly expensive inter-organizational activities in order to undertake changes, rather than attempt to change via obtaining focal discrete resources. Proposition 2 states that the primary factor that affects this choice is the degree of market failure that the resource exchange faces. Market failures exist when firms face difficulties in attempting to compose, consummate, and enforce arms length agreements to exchange assets.

Market failures may arise from several types of problems, including potential opportunism, coordination difficulties, and institutional legitimacy, which are distinctions that we will develop in greater detail below. For the moment, we simply note that exchanges characterized by a high degree of market failure require safeguarding and coordinating mechanisms that firms often find
more possible to create via inter-organizational exchange rather than through discrete exchange. Exchange of such resources requires organizational forms that enhance cooperation, proximity and repeated exchanges to transfer effectively resources among parties. Such organizational forms allow the internalization of resource exchange, with stronger opportunities to reduce behavioral uncertainty through internal or inter-organizational governance and to enhance learning and coordination through internal or inter-organizational socialization processes. The transaction cost and competence literatures that we discuss below help identify the conditions under which firms will select among different external modes of resource exchange.

Inter-organizational modes for managing resource exchange include inter-organizational alliances and business acquisitions. It is now well established in the literature on alliances that alliances represent a fast means of gaining access to tacit resources that cannot be transferred by one-shot licensing (Porter and Fuller, 1986; Doz, 1988, 1996). For example, Powell (1990: 317) notes that “it is in the unwritten, intangible character of much firm-specific knowledge that has led US firms, particularly the automakers, to form joint ventures in an effort to better understand their production processes. Similarly, Japanese companies have been attracted to joint project with US high tech because technological innovation cannot be simply purchase, it requires cumulative knowledge of the linkages among design, production and sales”. In parallel, the acquisitions literature recognizes that acquisitions represent a means to acquire resources that face discrete exchange difficulties (Hitt, Hoskisson, and Ireland, 1994; Hitt, Hoskisson, Ireland, and Moesel, 1996). Nelson and Winter (1982: 65) note that acquisitions bring a package of routines under unified control.

As a preliminary summary, one can initially categorize two distinct types of external mechanisms for resource exchange. First, businesses sometimes exchange discrete resources through permanent sale agreements or rental contracts such as licenses or franchises (Rugman, 1981; Tushman and Romanelli, 1985). Second, firms may acquire resources through inter-organizational modes, by allying with or buying firms (Wernerfelt, 1984). Firms will often prefer the first type of market mechanism for exchanging resources, because exchanging discrete resources usually entails lower costs and less organizational disruption than allying with or acquiring firms (Nees, 1981; Bowman and Singh, 1990). Despite any preferences for exchanging discrete resources, however, failures in the market for resources sometimes cause firms to conduct alliances or acquisitions in order to obtain new resources and use the new resources to change existing resources.

**Proposition 2: When a changing firm chooses an external mode to obtain resources, the greater the market failure that the resource exchange faces, the more likely the firm will use inter-organizational resource exchange rather than discrete resource exchange to undertake a change.**

In developing hypotheses concerning proposition two, we focus on three forms of market failure, including potential opportunism, need for cooperation by provider and user of resources, and lack of institutional legitimacy.

As we noted earlier, concerns about potential opportunism arise as one element of market failures. Market failures associated with potential opportunism stem from several causes,
including factor immobilities, information asymmetries and associated moral hazards, causal ambiguity, and monopoly (Caves, 1971; Hymer, 1976). The market for discrete resources is likely to fail when the value of resources is uncertain, which lead to potential opportunistic behavior. Other conditions in the market for discrete resources can also provide conditions for opportunistic behavior, including small numbers bidding situations, information asymmetry situations in a seller has greater knowledge than a potential buyer about a resource, unknown contingencies for coordination between the two partners. For example, interdependence among successive stages of production raises difficulty if occasions for adaptation are unpredictable yet common. Incomplete contracts will prospectively fail to anticipate or make correct responses for contingencies (Williamson, 1975). Firms facing market failures that arise from potential opportunism incur appropriation hazards if the firms attempt to obtain the resources via discrete resources exchange.

By appropriation hazards, we mean the extent to which it is difficult to specify, monitor, and enforce a discrete resource exchange contract (Teece, 1986). Appropriability refers to the ability of the owner of a resource to receive a return equal to the value created by that resource (Teece, 1986). Appropriation hazards arise in two dimensions, the intrinsic characteristics of the firms’ resources and the institutional environment within which the firm will obtain and use the resources (Oxley, 1999).

The first dimension of appropriation hazards concerns intrinsic resource characteristics. Problems concerning intrinsic characteristics of the resource exchange arise when the targeted resources involve uncertain future usage of transaction-specific assets (Williamson, 1975). The combination of transaction specificity and uncertainty makes it difficult to determine unambiguous contracts for resource exchange. In turn, assets that face high transaction specificity and uncertainty typically involve routines that are tacit, co-specialized or embedded, thereby making it difficult to determine appropriate prices for discrete resources or even to disentangle resources (Simon, 1969; Nelson and Winter, 1982; Huberman and Hogg, 1986; Itami and Roehl, 1987; Montgomery and Wernerfelt, 1988; Mitchell, 1994). Exchange difficulties become increasingly difficult as a resource moves up the scale from simple tacitness to organizational embeddeness (Peteraf, 1993; Conner and Prahalad, 1995). Acquiring tacit resources implies that the purchasing firm is able to understand and use the underlying tacit resources that compose the resources in order to retain the value and effectiveness of the tacit resources. Routines can be tacit at an individual level, in the sense of uncodifiable individual expertise, or can be tacit at a collective level, in the sense of requiring interactive participation by multiple people. In the case of individual level tacitness, hiring an expert allows the purchasing firm to benefit from the targeted resource. Even in the case of collective level tacitness, acquiring the targeted resources allows the firm to benefit from the targeted resource so long as the firm fully obtains the multi-person routines that are part of the resource. However, it become increasingly difficult for a firm fully to specify the terms of exchange for a resource that involves the activities of several people. Moreover, collective tacitness will often extend beyond the focal resource and also involve co-specialization and organizational embeddeness. In such cases of co-specialization and embeddeness, a firm may need to obtain the related resources or be able to reproduce routines that are equivalent to those that link them. Since it is difficult to value tacit, co-specialized, and embedded resources, market failure for specific resources will make allying with or acquiring the entire firm attractive relative to discrete resource exchange.
The intrinsic characteristics of the targeted resources can create appropriation hazards in the face of potential opportunism. Such problems often arise for tacit, co-specialized, and embedded resources. Tacit resources are not directly appropriable because they cannot be directly transferred. They can be appropriated only through its application to productive activity and through practice (Kogut and Zander, 1992; Grant, 1996). Similarly, co-specialized resources requires the appropriation of the focal resources, as well as the complementary resources, that can be appropriated through complex patterns of exchange and coordination, with potential opportunism from the owner of those assets. Finally, embedded resources makes the targeted resources very likely to be firm-specific and context-specific, and require the transmission of very subtle knowledge of the “particular circumstances of firm and place” (Hayek, 1945). In many instances, exchanging resources that rely on tacit, co-specialized and embedded routines will require the input of tacit, proprietary, knowledge from a number of different individuals and groups, each of whom must exchange some of her knowledge with other team members. The person or group that obtains proprietary knowledge has incentives to expropriate that knowledge for her own use or to leak it to competitors (Liebeskind, 1996:96).

When the targeted resources involves tacit, cospecialized and embedded routines, mechanisms for safeguarding discrete resource exchanges tend to be weak. Property rights such as patents, copyrights and trade secrets for tacit resources tend to be narrowly defined, costly to write and enforce, and easily overturned by competitors (Arrow, 1962; Williamson, 1985; Grossman and Hart, 1986; Teece, 1986; Hennart and Park, 1993; Chi, 1994; Liebeskind, 1996). Moreover, expropriation is more likely to be difficult and costly to detect than in cases of codified knowledge. Lack of clear property rights result in ambiguity over the ownership of the transferred resources, and provides favorable conditions for expropriation and imitation.

If a resource exchange exposes a firm to the leakage of proprietary knowledge, then a firm will take self-protective measures to reduce the leakage of such knowledge. Leakage of proprietary information may occur if the knowledge cannot be protected via legal instruments, possibly because the knowledge is much broader than legal instruments will cover or if legal instruments cannot be effectively enforced. Resources that, in a regime where proprietary knowledge is secure, would be contracted out will be undertaken by the firm instead (Teece, 1986). Unlike arms length exchanges, the particular institutional capabilities of firms protect resource value from appropriation more effectively than the market by aligning incentives among the contracting parties (Teece, 1986; Chi, 1994). Liebeskind (1996:94) notes that “Firms, as institutions, play a critical role of protecting valuable knowledge. Specifically, because property rights in knowledge are weak, and are costly to write and enforce, firms are able to use an array of organizational arrangements that are not available in markets to protect the value of knowledge”. We will use the term intrinsic appropriation hazards to refer to exchange issues that arise because of the tacitness, co-specialization, or organizational embeddedness of targeted resources.

**Hypothesis 2.1a:** The greater a resource exchange faces intrinsic appropriation hazards, the more likely a changing firm will use discrete resource exchange rather than inter-organizational modes to undertake a change.
The second dimension of appropriation hazards concerns characteristics of the institutional environment. We will use the term institutional appropriation hazards to mean “the set of fundamental political, social, and legal ground rules that establishes the basis for production, exchange, and distribution” (Davis and North, 1971: 6-7). Appropriation hazards that arise from the ability to enforce resource exchange contracts depend highly on the legal-regulatory context in which the firm operates. Legal regulatory context varies in terms of legal protections, enforcement costs, enforcement mechanisms, control of employee actions, binding noncompete agreements, and confidentiality clauses.

We expect that the relative use of discrete versus interorganizational resource exchange will vary according to such differences. Liebeskind (1996:104) notes that “in a legal-regulatory environment where legal protections are narrow, enforcement costs are high, or enforcement mechanisms are weak, we should expect to observe more knowledge transactions carried out within firms; concomitantly, where legal protections are more broad reaching, enforcement costs are relatively low, and enforcement mechanisms are strong, we should expect to observe more knowledge transactions carried out through contracting between firms or individuals”. Similarly, Oxley (1999) argues that variation in national appropriability regimes changes the relative costs of alternative governance mechanisms, thereby influencing the mode of resource exchange that firms employ in different countries.

Institutional appropriation hazards contain both an exogenous part and a firm-specific part. The exogenous part derives from the particular environmental context in which the firm operates. The firm-specific part arises from the firm’s position in the social environment. Firms with stronger social ties with other actors in the social environment will tend to face lower institutional appropriation hazards than firms with few linkages. That is, social networks sometimes provide protection against expropriation or imitation in knowledge transactions, such as exchange of valuable knowledge within professional networks (Williamson, 1991).

**Hypothesis 2.1b. The greater the institutional appropriation hazards that a resource exchange faces, the more likely a changing firm will use discrete resource exchange rather than inter-organizational modes to undertake a change.**

In addition to market failures that arise from potential opportunism, some market failures in the discrete exchange of resources arise from the need for ongoing cooperation by the provider and user of the targeted resources. By cooperation by the provider and user, we mean active collaboration in the process of exchanging and reconfiguring resources. We note here that opportunism and cooperation forms of market failure tend to arise jointly, as the same factors that give rise to the need for ongoing cooperation typically also create appropriation hazards. Should a non-opportunistic setting exist, however, the need for cooperation would influence the mode of resource exchange. What we will call the competence perspective on firm boundaries, which is rooted in behavioral and evolutionary firm theories (Penrose, 1959; Cyert and March, 1963; Nelson and Winter, 1982; Wernerfelt, 1984), has argued that the desire to exchange intangible resources motivates many alliances and acquisitions (Kogut and Zander, 1996). The competence perspective argues that firms use alliances and acquisitions in response to market failures that arise from tacitness, co-specialization, and organizational embeddedness of resources (Kogut and Zander, 1992; Polanyi, 1966; Galunic and Rodan, 1998). Exchange of tacit
resource tend to be slow, costly and through learning-by-doing (Kogut and Zander, 1992). Exchanging co-specialized resources requires cooperation among the different people and groups involved in the development of both the focal and complementary resources. Similarly, exchanging embedded resources requires a high level of cooperation among people in order to reproduce the supporting routines that span several functions and resources area within the firm and with its environment.

Resources that embed in a particular organizational and environmental contexts tend to involve firm-specific routines and context-specific routines, which represent disincentives to redeploy resources outside of their original context (Madhok, 1996). Technical resources tend be firm-specific and context-specific. For instance, manufacturing resources require coordination amongst manufacturing personnel and require complex linkages with other parts of the firm such as sales and marketing systems (Chi, 1994). Hayes and Wheelwright (1988) argue that firms need an informal organization of people who have developed good working relationships over a long period of time in order to efficiently handle the linkages between manufacturing and the rest of the firm. Furthermore, technical resources draw from local innovation systems and must adjust to local products and standards (Nelson, 1993). Similarly, marketing tend be firm-specific and context-specific. Marketing resources such as sales networks and brand names tend to develop over long periods in the context of the competitive conditions facing the firm and to embody tacit knowledge about the competitive environment (Dierickx and Cool, 1989; Hennart and Park, 1993). Sales network quality stems from the capability of a firm to manage complex buyer-seller relationships, which are often socially complex with significant local content (Capron and Hulland, 1999). The development of a strong brand name typically derives from a firm’s substantial ongoing investment in marketing communications and advertising, which has led to strong consumer awareness and acceptance of the brand (Rossiter and Percy, 1987). The unique nature of this historic investment between a brand and its consumers can be very idiosyncratic. The idiosyncracy suggests that there is a high risk of losing the value of a brand once taken outside of its context, so that an acquirer’s brand name cannot easily substitute for a target’s existing brand and vice-versa (Caves, 1996).

Exchanges of resources that require ongoing cooperation often require co-location of people within two or more organizations who will cooperate in the exchange and use of the resources over long periods (Oxley, 1999). While, in theory, firms might reach agreements to co-locate people to assist with discrete resource exchanges, even the best-intentioned firms will find it difficult to honour such agreements, as people take new jobs, firms’ priorities change, and people’s understanding of needs change. The basic point is that the knowledge of how to manage the cooperative resource exchange becomes embedded in routines that are beyond the control of individual managers of either the resource provider or user.

In sum, resources that tend to be tacit, co-specialized and embedded are the outcome of an ongoing cooperation that leads to idiosyncratic organizational context. On the one hand, transferring resources without taking care of their organizational context commonly leads to a substantial loss of the resource value. The targeted resource will lose part of its value by being redeployed into a different context, even if a firm has the ownership of the resource. On the other hand, intent to exchange the resources with their organizational context, or at least with the intent of reproducing similar supporting routines within the receiving firm, is difficult to achieve unless
the exchange involves very tight cooperation among the two contracting parties (Cantwell, 1989). The required level of cooperation required for transferring such resources is usually not suitable within a market transaction. Alliances and acquisitions can provide more effective organizational arrangements and socialization processes that are necessary to enhance cooperation among people from the transferring and the receiving organization.

In the competence view, resources that embed cooperation of people within a firm are difficult to exchange through market transactions no matter how much risk a firm is willing to take and how much cost the firm is willing to bear. Organizations provide superior mechanisms for transferring embedded resources across firms because they act as social communities, which creates productive and administrative knowledge embodied in people, procedures, and organizational routines (Kogut and Zander, 1992). This view emphasizes alliances or acquisitions as a means for easing resource redeployment by providing greater exposure to information and more comprehensive packages of supporting skills, thereby helping alliance or acquirers learn how to use resources in new ways (Nelson and Winter, 1982; Haspeslagh and Jemison, 1991). Chatterjee and Wernerfelt (1991) argue that the ability to acquire intangible resources such as R&D and marketing capabilities is a particularly strong incentive for acquisitions. Alliances and acquisitions make it possible for firms to undertake ongoing interactions needed to understand new resources through mechanisms such as cross posting of staff, corporate task forces, and joint management of shared functions (Kogut and Zander, 1992; Singh and Zollo, 1997). Through acquisitions, firms both acquire unfamiliar new resources and learn how to use their existing intangible resources in new organizational settings and competitive conditions (Penrose, 1959: 126; Mitchell, 1994; Singh and Zollo, 1997).

**Hypothesis 2.2: The greater the need for ongoing cooperation by the provider and user of targeted resources, the more likely a changing firm will use inter-organizational resource exchange rather than discrete resource exchange to undertake a change.**

A third class of market failures, in addition to those that arise from potential opportunism and coordination difficulties, arises from institutional legitimacy. By institutional legitimacy, we mean the degree to which a firm is viewed as a desirable member of a commercial and social community. A firm that lacks institutional legitimacy, either as a corporation as a whole or as a participant in a particular business area, will find it difficult to attract skilled people, as well as to attract relationships with external parties such as suppliers and distributors.

Institutional legitimacy market failures usually arise in cases when firms lack key ex ante resources needed to participate in a market and/or internal routines needed to reconfigure peoples’ skills and the existing resources of the changing firm. Market failure stemming from legitimacy problems may also arise as a form of liability of newness, affecting new corporations, established corporations that are undertaking business diversification, or foreign firms that are entering new geographic markets. The prior section suggested that the lack of key resources would lead the firm to undertake external resource modes, such as hiring new people with needed skills, rather than internal development. In such cases, though, people with desirable skills will often be reluctant to join the firm. Even if the firm cannot attract desired individuals, the firm may be able to obtain the needed skills by allying with another firm or acquiring a
business, rather than hiring individual people, as long as it has sufficient financial resources and other business resources.

Alliances and acquisitions offer two opportunities to overcome the legitimacy-based market failure in hiring individuals. First, the changing firm can negotiate with a firm, rather than an individual, and if it offers enough financial and other inducements sooner or later is likely to find a willing exchange partner. Second, an alliance or acquisition will help the firm gain critical mass needed to generate the legitimacy that it requires in order to hire skilled individuals. The lack of resources and reconfiguration routines reduced the likelihood of change via internal development and increased the likelihood of external modes of change. In turn, the lack of legitimacy reduces the likelihood of using a particular form of discrete resource exchange, hiring skilled people, and increases the likelihood of the other external modes, alliances and acquisitions.

**Hypothesis 2.3. The lower the institutional legitimacy of a changing firm, the more likely the firm will undertake inter-organizational modes rather than discrete resource exchange to undertake a change.**

The three forms of market failure will tend to intertwine in cases that involve extensive resource exchange. Cases in which a changing firm must obtain many resources, particularly if the exchange involves many different types of resources, will often involve issues concerning appropriation, coordination, and legitimacy. We will refer to the scope of resource exchange as the number of types of resources that the firm is obtaining. The greater the scope of resource exchange, the more likely the firm will use an inter-organizational mode rather than discrete exchange of individual resources.

**Hypothesis 2.4. The greater the scope of resource exchange, the more likely a changing firm will use inter-organizational modes rather than discrete resource exchange to undertake a change.**

The simplest form of the prior hypotheses assumes that all firms have similar capability to protect and coordinate resources. However, firms will tend to develop differential abilities to exchange resources. The mode experience factor that we discussed in the earlier section concerning internal versus external modes arises here. Mode experience jointly addresses all three classes of market failure. Firms with substantial experience with a particular mode will tend to develop skills that allow them to address issues concerning potential opportunism, coordination, and institutional legitimacy that may associate with that particular mode. Moreover, independent of skills, firms may develop path dependent tendencies to reuse a particular mode.

**Hypothesis 2.5. The greater a changing firm’s discrete exchange mode experience, the more likely the firm will use discrete exchange rather than inter-organizational modes to undertake a change.**

Firms will also develop differential abilities to overcome each type of market failure. Liebeskind (1996) notes that firms differ in their internal capabilities to safeguard their knowledge. That is,
firms can both differentially prevent expropriation of knowledge and differentially reduce the observability of knowledge and its products, thereby protecting against imitation. We will use the term safeguarding capabilities to refer to a firm’s skill at protecting the value of its property rights. Safeguarding capabilities include factors within the firm such as legal skill and ability at protecting secrets. Safeguarding capabilities also include a firm’s network of relationships, which may help protect it in otherwise risky institutional environments. The safeguarding capability factor will help discriminate between a firm’s preference for discrete and inter-organizational exchanges. Firms that have weak safeguarding capabilities will tend to prefer discrete resource exchange, because such exchanges involve less opening up to the scrutiny and entry of alliance partners or of firms that are considering selling a business to the changing firm. By contrast, firms with strong safeguarding mechanisms will be more willing to become involved with alliance partners or potential business sellers.

**Hypothesis 2.6:** The stronger a changing firm’s safeguarding capabilities, the more likely the firm will use inter-organizational modes rather than discrete resource exchange in order to undertake a change.

Firm-level differences concerning reconfiguration capabilities also arise. Firms differ in their absorptive capacity to digest knowledge from external sources, that is, their ability decontextualize and recontextualize the knowledge into a different context (Doz and Santos, 1997; Brannen, Liker and Fruin, 1998). We will use the term independent reconfiguration capability to describe the capability of undertaking post-exchange reconfiguration without the participation of the provider of a target resource. Elements of the reconfiguration ability will include personal skills of the firms’ employees and organizational systems for assessing the intrinsic nature of a resource’s routines.

**Hypothesis 2.7a.** The greater a changing firm’s independent reconfiguration capability, the more likely the firm will use discrete exchange rather than inter-organizational modes to undertake a change.

A related factor also arises here, concerning inter-organizational reconfiguration abilities. By inter-organizational reconfiguration abilities, we mean a firm’s ability to manage the process of resource reconfiguration following alliances or acquisitions. Just as firms may have stronger or weaker independent reconfiguration capabilities, so may they have weaker or stronger inter-organizational reconfiguration abilities. In part, such reconfiguration abilities arise through mode experience. In part, too, they arise through active development of particular reconfiguration systems (Singh and Zollo, 1997). In addition, post-alliance or post-acquisition reconfiguration will often face substantial internal institutional resistance from current employees, who may resist the use of resources that they associate with other firms and other managerial systems. For instance, the post-acquisition literature suggests that recombining internal resources with resources from an acquired business often creates major disruption in the receiving firm. Therefore, firms with only limited inter-organizational reconfiguration abilities will often prefer discrete resource exchange, which may less organizational disruption than allying with or acquiring another business (Nees, 1981; Bowman and Singh, 1990).
Hypothesis 2.7b. The weaker a changing firm’s inter-organizational reconfiguration ability, the more likely the firm will use discrete exchange rather than inter-organizational modes to undertake a change.

In summary, we have so far argued that managers face substantial internal constraints to adjusting resources and, therefore, sometimes must turn to external modes of resource acquisition. We have shown that failures in the market for resources sometimes will cause firms to ally with or buy businesses rather than exchange discrete resources. Proposition 2 states that when a changing firm chooses an external mode to obtain resources, the greater the market failure that the resource exchange faces, the more likely the firm will use inter-organizational resource exchange rather than discrete resource exchange to undertake a change. We have identified three elements of market failure, arising from potential opportunism, the need for ongoing cooperation between provider and user of resources, and institutional legitimacy. As in the case of resource relevance, routines underlie each of the elements of market failure. We now turn to the examination of the tradeoff between alliances and acquisitions.

2.3. Alliances Versus Acquisitions

The third distinction in Figure 1 concerns the choice between alliances and acquisitions as inter-organizational modes of change. Simply in terms of cost, firms will often prefer alliances to acquisitions, because alliances tend to involve lower expenditure and immediate disruption. Indeed, we agree with Williamson (1985) that internal organization adds bureaucratic costs, so that full internalization, as represented by business acquisition, can be thought of as the organization form of last resort. Firms typically are better off if they first carefully consider alliances before undertaking the costs and difficulties of acquisitions. In many cases, though, firms must turn to acquisitions in order to achieve desired changes. Proposition 3 states that the tendency to use business acquisitions as modes of change will increase with the scope of market failure that resource exchange faces. Several subsequent hypotheses refine proposition 3.

Proposition 3 derives from the need to safeguard and coordinate the use of existing and target resources. We use the term scope of market failure to refer to the number of resources that a market failure affects. An exchange has a low scope of market failure when only a few resources face appropriation or coordination issues. An exchange has a high scope of market failure when many resources face appropriation concerns or will require substantial coordination. Exchange cases that involve many resources that face market failure, whether due to risk of losing value or coordination difficulties in creating value will tend to be better suited to acquisitions than to alliances. Although opportunism and bounded rationality tend to remain even within the 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, 1996). The alliance literature has extensively stressed the problems associated with partner opportunism, including hidden agenda, resource appropriation (Hennart, 1982). In the international business literature, empirical studies suggest that the higher the propriety content of a firm’s resources, the more the firm will prefer expansion via full ownership rather than partial ownership (Anderson and Gatignon, 1986; Hennart, 1982). Acquisitions provide the changing firm with greater long term control of resource use, which helps protect against
appropriation problems. In addition, acquisitions provide the changing firm with greater control of resource reconfiguration, which helps ensure successful reconfiguration.

**Proposition 3:** When a firm chooses an inter-organizational resource exchange mode to undertake a change, the greater the scope of market failure, the more likely the changing firm will use business acquisitions rather than alliances.

Each of the three forms of market failure will create incentives for acquisitions. Firms facing appropriation hazards will tend to prefer acquisitions in order to gain greater control of the resources. Firms requiring cooperation will tend to expect greater ongoing cooperation from employees of the merged business than from employees of a business ally. Firms facing institutional legitimacy problems may find it difficult to attract business allies, but may instead be able to purchase other firms if they offer a large enough payment.

**Hypothesis 3.1a.** The greater the appropriation hazards of a resource exchange, the more likely a changing firm will use business acquisitions rather than alliances to undertake a change.

**Hypothesis 3.1b.** The greater the need for ongoing cooperation by the provider and user of targeted resources, the more likely a changing firm will use business acquisitions rather than alliances to undertake a change.

**Hypothesis 3.1c.** The lower the institutional legitimacy of a changing firm, the more likely the firm will use business acquisitions rather than alliances to undertake a change.

The scope of resource exchange also enters here, as it did in the case of discrete versus inter-organizational resource exchange. Changes that require firms to obtain a particularly wide variety of resources will commonly involve acquisitions rather than alliances, owing to the joint presence of several aspects of market failure.

**Hypothesis 3.2.** The greater the scope of resource exchange, the more likely a changing firm will use acquisitions rather than alliances to undertake a change.

Several additional factors refine and condition Proposition 3. We address mode experience, resource relevance, safeguarding capabilities, and independent reconfiguration capabilities.

One factor concerns mode experience. As in the earlier sections, firms with greater experience of a particular mode will tend to rely on that mode for future changes. This reliance stems both from the development of systems that will support the use of that mode and from the presence of path dependent inertia.

**Hypothesis 3.3a.** The greater a changing firm’s experience with an inter-organizational mode, the more likely the firm will use that mode to undertake a change.

Moreover, we noted earlier that firms will also develop inter-organizational reconfiguration abilities. Such abilities will often differentiate as acquisition and alliance reconfiguration
abilities. By acquisition reconfiguration capabilities, we mean explicit and tacit systems that a firm uses to redeploy resources to and from acquired businesses (Jemison and Sitkin, 1986; Haspeslagh and Jemison, 1991; Pablo, 1994; Zollo, 1996). Similarly, by alliance reconfiguration capabilities, we mean systems that a firm uses to learn from its alliances (Dussauge, Garrette, and Mitchell, 1998). In part, such capabilities will tend to increase with experience. Nonetheless, the skills will also tend to vary across firms, partially independent of experience.

**Hypothesis 3.3b.** The stronger a changing firm’s acquisition reconfiguration capabilities, the more likely the firm will use acquisitions to undertake a change.

**Hypothesis 3.3c.** The stronger a changing firm’s alliance reconfiguration capabilities, the more likely the firm will use alliance to undertake a change.

Consider also resource relevance, which raises coordination issues. In the earlier section concerning internal and external modes, we argued that firms that lack relevant resources will tend to use external modes rather than internal development, because the firms lack the ability to undertake successful development. We further argue, at this point, that firms that lack relevant resources will often lack the ability to manage a successful post-acquisition resource reconfiguration process. Quite simply, firms that lack relevant knowledge of targeted resources will often be reluctant to undertake a business acquisition, because they will be responsible for the post-acquisition reconfiguration of their existing resources and the targeted resources. Although, the firm will obtain people who understand the targeted resource during the acquisition, there is no guarantee that key people will remain with the merged business after the acquisition. Even if key people do remain with the merged business, senior managers from the acquiring business will often lack the knowledge that they need to direct and assess the activities of the new employees. Instead, firms that lack relevant resource will be more likely to undertake an alliance with another organization, in order to gain the participation of the other organization in reconfiguring the resources. Such participation is often risky and difficult, because the changing firm must again depend on the effective participation of an autonomous firm. However, the alliance provides a staged process of learning about the targeted resources, along with the potential fit with existing resources, in which the changing firm does not need to take full responsibility for the change.

**Hypothesis 3.4:** The less relevant the changing firm’s existing resources are to the targeted resources, the more likely the firm will use alliances rather than business acquisitions to undertake a change.

Notice that the market failure hypotheses and the resource relevance hypothesis will sometimes have conflicting impact, if a firm faces both extreme market failure and low resource relevance. In such cases, we suspect that many firms will be unable to attempt to change. Instead, they will frequently become targets of other firms that value their resources. Those firms that do attempt to change in such circumstances might use either external method, but will find it particularly difficult to succeed.
Next consider safeguarding capabilities, which we discussed in the prior section. To the extent that firms use acquisitions rather than alliances because they fear appropriation by alliance partners, firms with superior safeguarding capabilities will be more likely to use alliances.

**Hypothesis 3.5:** The stronger a changing firm’s safeguarding capabilities, the more likely the firm will use alliances rather than business acquisitions in order to undertake a change.

Finally, firms will tend to use alliances as an inter-organizational mode when target resources are only a small subset of the resources of a potential inter-organizational partner. We will use the term target resource proportion to refer to the ratio of desired resources within another firm to the total resources of the other firm. The cost of disposing of undesired resources will often outweigh the value of obtained target resources. Hennart and Reddy (1997) found that firms preferred joint ventures over acquisitions when the desired resources commingled with nondesired resources. In other words, the more that targeted resources are a small part of another firm, the more the more likely the changing firm will use alliances rather than acquisitions.

**Hypothesis 3.6.** The smaller the target resource proportion within other firms, the more likely a changing firm will use an alliance rather than an acquisition to undertake a change.

The ability to retract from resource use will influence inter-organizational mode choice in two ways. First, uncertainty concerning the environment will influence the choice between acquisitions and alliances. When firms face high uncertainty concerning how technical or market change will influence what resources they will need, in Frank Knight’s (1922) sense of uncertainty as simply not knowing what will happen in the future, then alliances provide greater flexibility than acquisitions. In most cases, alliances are easier and cheaper to retract from than acquiring another business, should the resources that the inter-organizational mode provides access to prove to be unsuited to the changing environment.

**Hypothesis 3.7a:** The greater the uncertainty, the more likely a changing firm will use an alliance rather than a business acquisition to undertake a change.

The second retractability element concerns the importance of the resources in the firm’s long term goals. When target resources are central to a firm’s long term goals, then the incentive to undertake an acquisition rather than an alliance will increase. By central to a firm’s long term goals, we mean resources that the firm expects will influence many aspects its business in the future. Conversely, target resources that do not figure at the centre of a firm’s long term plans will often suit an alliance.

**Hypothesis 3.7b:** The more central the target resources are to the changing firm’s long term goals, the more likely the firm will use a business acquisition rather than an alliance to undertake a change.

In summary, we discriminate between the modes that firms will use when they turn to external modes. Proposition 3 predicts that firms will increasingly turn to acquisitions rather than alliances as the scope of market failure increases. We then predict that acquisitions will become
more likely as market failure increases on each of its three dimensions, appropriation risk, need for coordination, and institutional legitimacy. Acquisitions also become more likely with increased scope of resource exchange, acquisition experience, and acquisition reconfiguration ability. By contrast, alliances become more likely with increased alliance experience, alliance reconfiguration ability, weak resource relevance, strong safeguarding skills, decreased proportion of target resources, and uncertainty. As in the earlier sections, routines underlie the elements of market failure.

2.4. Contextual Factors

We now turn to three contextual factors that will influence mode choice. These factors are cost, time pressures, and resource availability.

Clearly, the relative costs of different modes will influence mode choice. We have left this point until now, though, rather than start with the issue of cost, because mode cost will tend to be an outcome of the resource relevance and market failure factors that we discussed in the earlier sections. In part, the cost of developing or obtaining resources is an exogenous factor, simply given by the type of resource. In greater part, though, resource cost is an endogenous outcome of a firm’s existing resource endowment, including all resource endowment elements that we have discussed so far. Firms with differentially relevant resources with respect to the targeted resource will incur different costs if they attempt to undertake internal development. Different modes face different cost issues. Internal development will often entail replicating resources that already exist outside the firm. The greater the cost of such internal development, where costs include factors ranging from direct investment in physical assets, to governance and organization costs, to learning costs, the more likely a firm will turn to external sources to obtain resources. As we noted earlier, discrete resource exchange, if feasible, will often be less expensive than inter-organizational modes. The most interesting issues arise when a seemingly less expensive option is undesirable, owing to resource relevance or market failure factors.

Hypothesis 4.1: The greater the cost of using a mode to undertake a change, the more likely a changing firm will favor other modes to undertake a change.

Time pressure will also influence mode choice. Firms that face greater time pressure for change will often use external modes. By time pressure for change, we mean the perceived need to undertake a change quickly. Sources of time pressure include external competitive pressure and intrinsic internal desires to change quickly. Greater time pressure means that a firm has less time in which to create or recombine routines in order to create new resources (Dierickx and Cool, 1989). In the face of time pressure, firms will often turn to external modes in order to acquire new resources quickly. Rapid competitive changes often allow businesses too little time to develop resources internally (Singh and Montgomery, 1987; Stalk and Hout, 1990). Therefore, businesses often can not develop new resources internally or employ existing resources in new internal uses quickly enough to meet competitive demands.

We expect an increasing emphasis by time pressure, first on discrete exchange and then on inter-organizational modes. Inter-organizational modes often provide quicker access to resources than discrete resource exchange, because discrete resource exchange usually must be followed by
substantial resource reconfiguration. It is not clear that time pressure will discriminate between alliances and acquisitions, however, as both modes offer immediate access to existing resources and the context in which they operate.

**Hypothesis 4.2a:** The greater the time pressure for change, the more likely a changing firm will use external modes to undertake a change.

**Hypothesis 4.2b:** The greater the time pressure for change, the more likely a changing firm will use an inter-organizational modes rather than discrete resource exchange to undertake a change.

Resource availability also creates a contextual influence. External resource availability refers to the existence of external resources and potential partners, as well as institutional limits such as laws and norms that reduce tradability. On the one hand, this prediction seems almost tautological. In practice, though, studying the influences of external availability is highly interesting, owing to the many factors that may reduce availability. Some such factors are traditional competitive factors, such as the number of potential partners or targets. Other factors arise from institutional sources such as laws and norms that constrain particular modes, such as alliances and acquisitions. Therefore, this prediction warrants study, if only to investigate the factors that limit or increase the availability of external resources in different contexts.

**Hypothesis 4.3a.** The lower the externally availability of the targeted resources, the more likely a changing firm will use internal development of resources to undertake a change.

Moreover, the availability of potential partners clearly must condition the use of inter-organizational modes. Partner availability will depend on factors such as the number of firms that operate in a market, the number of existing relationships that other firms have formed, and laws and norms that constrain the use of particular modes.

**Hypothesis 4.3b:** The lower the availability of potential partners, the more likely a changing firm will use discrete resource exchange rather than inter-organizational modes to undertake a change.

**Hypothesis 4.3c:** The greater the relative availability of potential acquisition targets and potential allies, the more likely a changing firm will use the more available inter-organizational mode to undertake a change.

On first reading, it may appear that we are omitting an obvious factor that might influence the choice of internal versus of external modes, which is the degree of transaction specificity of the assets involved in the change. Transaction cost economics argues that firms will tend to internalize transactions that depend on idiosyncratic investment (Williamson, 1975), with the primary logic drawing from bounded rationality and potential opportunism. While at first thought asset specificity might seem to provide a distinction between internal and external modes of change, further reflection moves away from this conclusion, for two reasons. First, two of the external modes result in internalization of any transaction specific assets, via discrete resource exchange and via business acquisitions. Second, even alliances, which are the third external
mode, provide means for protecting the value of idiosyncratic investment, via careful choice of governance mechanisms such as equity holdings and cross-licensing (Oxley, 1999). Overall, we view the firm’s abilities to use and develop the resources as having the main influence on choice of modes for changing businesses. Once firms have decided on a mode, they will then attempt to create governance mechanisms that protect them from losing the value of their resources.

2.5 Proposition Summary

We have developed three focal propositions, plus a set of contextual factors. We consider four modes of business change, including internal development, discrete resource exchange, alliances, and business acquisitions. The focal propositions emphasize the impact of relevant resources and market failure on choice of modes of change. We developed several specific attributes of the general concepts of resource relevance and market failure. Each of the attributes arises from the concept of firm-specific routines and addresses implications of the argument that routines influence the mode of business change. Attributes of resource relevance include resource closeness, resource strength, internal development mode experience, extensive internal mode experience, internal resource linkages, internal reconfiguration routines, external resource linkages, importation reconfiguration routines, resource conflict, semi-autonomous subunits, and scope of change. Attributes of market failure include intrinsic appropriation hazards, institutional appropriation hazards, need for ongoing cooperation, institutional legitimacy, scope of resource exchange, discrete exchange mode experience, safeguarding capabilities, mode reconfiguration ability, mode experience, resource relevance, uncertainty, and goal centrality. Together, these factors outline a framework for assessing potential modes by which managers will attempt to change their businesses.

We stress that the predictions that we have developed do not lead to unambiguous choices concerning modes of change. There are conflicting influences among several of the factors, which we believe is consistent with the conflicting signals to which managers must attempt to respond. Rather than an unambiguous solution to understanding change modes, our set of predictions provides a sequential process of decision making that helps describe the issues and considerations that managers face when they attempt to undertake the difficult task of changing their businesses.

3. BUSINESS CHANGE IN THE TELECOMMUNICATIONS INDUSTRY

In this section, we outline the results of a series of interviews that we conducted with managers of telecommunications companies that operate in Europe. The interviews focused on changes that the firms needed to undertake in order to address environmental trends in the corporate client segment of the Information Communication Technology (ICT) business. The ICT corporate client product-market segment of the telecommunications industry combines telecommunications and information technology skills and services. We conducted eleven interviews with managers of eight telecommunications firms during the fall of 1998. The managers were senior corporate and business unit executives. The first eight of the interviews were open-ended discussions of how the managers attempted to change their businesses, while
we used a semi-structured interview format for the remaining three interviews. Appendix 2 reports the question format for the semi-structured interviews.

The interviews provide exploratory investigation of the propositions that we develop in the previous section of this paper. We set the basic propositions and most hypotheses before the undertaking the interviews, based on our reading of relevant literatures. We then added and refined several hypotheses as the interviews proceeded. We stress that the interviews primarily provide theory building, rather than theory testing.

Because we promised confidentiality, we will refer to the firms as firms A through H. Firm A is a recent telecommunications industry start up firm. Firms B through H are established telecom incumbents of the telecommunications industry. Ten of the firms have their headquarters in Europe, while the other firm is a North American company that has extensive operations in Europe.

Tables 3a and 3b outline examples of business changes and target resources. The changes and resources reflect the substantive changes that are taking place in the telecommunications environment, in which regulatory, technical, competitive, and market transformations are affecting most or all aspects of telecommunications company activities. The desired changes emphasize three aspects of our change typology, products, markets, and organization. The fourth aspect, production processes, also received some mention during the discussions. Targeted resources tended to emphasize R&D skills, marketing skills, and managerial skills. The remaining two elements of our resource typology, production skills and financial skills, received less mention, owing to the nature of the product-market and the established position of most firms.

********** Table 3a and Table 3b about here **********

Tables 4.1 through 4.4 summarize the results of the interviews. Overall, the interviews provide substantial support for the predictions. In many cases, the managers raised the issues themselves, without prompting from our questions. In other cases, especially as we moved into the more structured phase of the interview series, we found that the managers were familiar with the issues that we addressed. A few of the issues did not arise during the interviews, providing neither support nor rejection for the relevant hypotheses.

Most dimensions of resource relevance figure prominently in Table 4.1, which addresses internal versus external modes of change. Resource closeness (H1.1), resource strength (H1.2), mode experience (H1.3), internal resource linkages and reconfiguration routines (H1.4), external linkages and importation reconfiguration routines (H1.5), and resource conflict and semi-autonomous subunits (H1.6) all received substantive comment with the expected influences during the interviews. The remaining factor, scope of change (H1.7) primarily arose in the context of discussing resource closeness and resource strength.

********** Table 4.1 about here **********
An intriguing implication also arose during the comparison of internal and external modes of change, concerning managerial recognition of the need for change and identification of modes of change. There was evidence during the discussion of H1.3 that path dependence sometimes constrains firms’ activities. At the same time, though, many managers were aware of the potential problems that path dependence imposes and were attempting to overcome the inertia by using modes of change that suited the diversity of resources that they required.

Several dimensions of market failure arise in Table 4.2, which addresses discrete versus inter-organizational external modes. Two of the three types of market failure received common mention, including the need for ongoing cooperation in resource use (H2.2) and institutional legitimacy (H2.3). By contrast, the third type of market failure, appropriation hazards that stem from intrinsic resource characteristics or institutional hazards (H2.1), received little mention as a factor in distinguishing between discrete and inter-organizational exchange. The lack of mention of appropriation hazards might occur because they simply take it for granted as an important factor, but the factor did not figure as an important issue even in the semi-structured interviews. Instead, the appropriation issue arose more commonly in the comparison of alliances versus business acquisitions, which we discuss later. Scope of resource exchange (H2.4), which reflects all three types of market failure, also received some mention.

Reconfiguration ability (H2.7) also arose as a key factor in distinguishing between discrete exchange and inter-organizational modes. The managers with whom we spoke raised this issue both independently and in response to our questions. The degree to which their firms possessed routines needed to undertake independent change and inter-organizational change clearly emphasized their choice of modes.

A few dimensions arose only rarely in the discussion of discrete versus inter-organizational change. As we noted above, few managers raised the issue of intrinsic appropriation hazards (H2.1). Discrete exchange mode experience (H2.5) received little attention, again suggesting that the managers are aware of path dependency issues and attempt to overcome them. Internal safeguarding capabilities (H2.6) did not arise as an issue here, consistent with the lack of attention to intrinsic appropriation hazards. Thus, through the first two stages within Figure 1, of internal versus external modes and discrete exchange versus inter-organizational modes, the issues tended to emphasize what Williamson refers to as competence factors more than governance factors. That is, the initial issues that influenced mode choice tended to be issues concerning what the firm was able or not able to do. Only after selecting a mode that built on prior competence or addressed competence limits, did the firms tend to turn to governance issues in order to protect the value of their changes.

Several dimensions of the scope of market failure arise in Table 4.3. Appropriation hazards (H3.1a) now emerge as a major factor in distinguishing between alliances and acquisitions, with some additional reference to the need for ongoing cooperation (H3.1b) and institutional legitimacy (H3.1c). Mode experience and mode reconfiguration abilities (H3.3) were common determinants of mode choice. Resource relevance (H3.4) received some attention. The interviews also drew our attention to the retractability issues of uncertainty and goal centrality (H3.7).
A few elements received little discussion. Scope of resource exchange (H3.2) did not arise as a focal topic. Safeguarding capabilities (H3.5) and target resource proportion (H3.6) did not arise during the discussions. These areas provide fruitful elements for further analysis.

These results reveal an important contrast concerning appropriation risks, when considering the inter-organizational mode choices versus the earlier considerations of internal and discrete mode choices. Where appropriation risks did not figure as important issues earlier, they appear as key elements of the choice between acquisitions and alliances. The emergence here suggests that appropriation concerns may commonly intertwine with the ability of another firm to gain close interaction with a changing firm, via an alliance. That is, risks of appropriation may tend to be most severe when coupled with ongoing inter-organizational activities. Discrete changes, by contrast, may tend to involve lower risks of appropriation, both because of the more limited scope of the exchange and because of the greater ability to define adequate contractual safeguards. The core implication of this contrasting result is that governance issues often arise from competence issues, particularly in the context of ongoing inter-organizational development of competence.

Finally, the three sets of contextual factors emerge as issues in Table 4.4. The managers addressed the issues of relative cost, time pressure for change, and availability of alternatives, particularly in the structured interviews.

In summary, the interviews re substantively consistent with most predictions of the conceptual framework that we developed. The framework identifies four modes of change and two sets of factors that will influence mode choice. The interviews focused on several dimensions of the mode choice factors, emphasizing dimensions that involve organizational routines. The results of the interviews are consistent with a sequential change model in which firm first compare internal and external modes and then chose between different external modes. The results also are consistent with an escalating emphasis on change via first emphasizing internal development of existing resources, next undertaking discrete resource exchange via hiring knowledgeable people with tacit skills, and then undertaking inter-organizational modes. Firms often use alliances to obtain wider-scope tacit skills that are outside a firm's existing knowledge base and use acquisitions to obtain core resources and resources that face high appropriation risks. Mode experience and the presence of specific reconfiguration routines that suit particular modes also condition mode choice.

4. CONCLUSION

This paper outlines a model of change mode choice. Figure 1 depicted the basic elements of the model, in which issues concerning resource relevance and market failure lead firms to undertake increasingly complex modes of change. A series of exploratory interviews in the corporate client
The interviews also suggest preliminary implications for the comparison of how incentives to develop and protect competence affect mode choice. Among simpler modes, such as the use of discrete resource exchange, the primary initial influences arose from issues concerning a firm’s possession or lack of needed competence, while protection factors arose mainly as a consequence of competence-based choices. Among the more complex inter-organizational change modes of alliances and acquisitions, however, resource protection concerns emerged as first stage issues along with competence needs. As we noted earlier, the risks of appropriation may tend to be most severe when coupled with ongoing inter-organizational activities that involve changes on several dimensions and substantial tacitness in defining and forecasting resource development outcomes.

Of course, the mode choices that Figure 1 depicts are partially inter-dependent. That is, firms do not chose only to undertake internal development or only to undertake an external mode. Instead, modes tend to undergo cumulative choice, in the sense that each higher level mode often involves elements of lower level modes. For instance, change via discrete resource exchange typically also involves internal development, while change via inter-organizational modes often also involves both internal development and discrete exchange. Thus, one can view the model of mode choice in Figure 1 as a cumulative model of increasing mode complexity.

In conclusion, we stress two factors concerning the conceptual framework and the empirical analysis. First, we have chosen a conceptual approach that identifies routine-based factors that managers commonly face in making decisions concerning business change. Our approach reflects the complicated reality of business change, attempting to outline possible routes by which managers can attempt to change their firms. Our approach does not lead to unique predictions that unambiguously identify change modes. Instead, we identify factors that will influence tendencies to chose different modes. We believe that this approach is appropriate in the context of complicated business environments, in which boundedly rational managers rarely face unique choices. This ambiguity underlies the seemingly fragmented choices that firms make in the face of environmental demands. The ambiguity may also underlie the recent tendency in the strategy and organizational literatures to under-emphasize studies of how businesses change, in favour of more constrained approaches that focus on inertial tendencies. While we are highly sympathetic to inertial arguments, believing that path dependency undoubtedly conditions business change, our primary conceptual interest lies in understanding why firms change in the face of inertia. We believe that an increased understanding of business change requires a multi-faceted approach. We also believe that the conceptual base of routines and resources as units of analysis provides a useful element of such an approach.

Second, our initial empirical approach emphasizes theory building rather than theory testing. This approach is appropriate to the multi-dimensional nature of our conceptual framework. We believe that further empirical work initially will refine the theory and ultimately can test key elements that emerge from the theory building stage.
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Table 1. Conceptual assumptions

<table>
<thead>
<tr>
<th>Elements of theory</th>
<th>Assumptions</th>
<th>Implications concerning modes of change *</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Behavioral assumptions</td>
<td>Bounded rationality, with firm-specific foresight; potential self-interest.</td>
<td>Contracts are not self-enforcing due to bounded rationality and potential self-interest. We assume that economic actors have the capacity to look ahead and identify modes of change that will create and protect valuable resources, but that firm-specific constraints arising from existing resources shape their choice of modes.</td>
</tr>
<tr>
<td>2. Unit of analysis</td>
<td>Routines (tacit, co-specialized, organizationally-embedded), which combine to form resources. Use of resources generates value. Production costs are outcomes of resources.</td>
<td>The firm consists of routines that underlie the firm's resources. Routines create inertia and path-dependence. Changing resources and obtaining new resources implies changing the underlying routines, by recombining existing routines and creating new routines.</td>
</tr>
<tr>
<td>3. Description of the firm</td>
<td>Structure for governing routines and resources. Governance includes coordination, creation, and protection.</td>
<td>Firms govern the creation of new routines and resources. A resource change that involves combining different set of routines will involve some degree of overlap, complementarity, or conflict.</td>
</tr>
<tr>
<td>4. Purposes served</td>
<td>Economizing on the sum of production costs and governance costs. Multi-faceted cost dimensions create substantial ambiguity concerning economizing choices and scope for self-interested choices.</td>
<td>A firm will attempt to create new resources if it expects that doing so will obtain greater value than not changing, but mode choice faces substantial ambiguity. Inertia imposed by existing routines shapes internal creation. Path dependence and institutional environments influence the choice of external modes of change.</td>
</tr>
<tr>
<td>5. Efficiency criterion</td>
<td>Relative efficiency of current and future use of overall set of firm resources, based on feasible alternatives</td>
<td>A firm seeks the best available mechanisms for jointly coordinating and protecting current resources, while creating new resources. Firms may face tradeoffs between protecting the value of resources and creating resources.</td>
</tr>
</tbody>
</table>

* Our focal question is: What mode will a firm use to change its resources, given the characteristics of the firm's existing resources, targeted resources, and the institutional environment? 

**Definitions**

Routines: Regular pattern of business activity embodied in human and physical resources (Winter, 1990)

Resource: Tangible or intangible assets that are tied semi-permanently to the firm (Wernerfelt, 1984)
Table 2. Predictions

1. Internal versus external

<table>
<thead>
<tr>
<th>H Resource relevance</th>
<th>Mode</th>
<th>2. Discrete exchange v. inter-organizational</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.1 Resource closeness</td>
<td>Internal</td>
<td>Proposition 1. The greater the relevance of a changing firm’s existing resources to the targeted resources, the more likely the firm will use internal development rather than external modes to undertake a change.</td>
<td>Discrete</td>
</tr>
<tr>
<td>1.2 Resource strength</td>
<td>Internal</td>
<td>Proposition 2. When a changing firm chooses an external mode to obtain resources, the greater the market failure that the resource exchange faces, the more likely the firm will use inter-organizational resource exchange rather than discrete resource exchange to undertake a change.</td>
<td>Internal</td>
</tr>
<tr>
<td>1.3a Internal development mode experience</td>
<td>Internal</td>
<td></td>
<td>Inter-org</td>
</tr>
<tr>
<td>1.3b Extensive internal mode experience</td>
<td>External</td>
<td></td>
<td>Inter-org</td>
</tr>
<tr>
<td>1.4a Internal resource linkages</td>
<td>Internal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.4b Internal reconfiguration routines</td>
<td>Internal</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.5a External resource linkages</td>
<td>External</td>
<td></td>
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<tr>
<td>1.5b Importation reconfiguration routines</td>
<td>External</td>
<td></td>
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</tr>
<tr>
<td>1.6a Resource conflict</td>
<td>External</td>
<td></td>
<td></td>
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<tr>
<td>1.6b Semi-autonomous subunits</td>
<td>External</td>
<td></td>
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<tr>
<td>1.7 Scope of change</td>
<td>External</td>
<td></td>
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</tbody>
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2. Discrete exchange v. inter-organizational

<table>
<thead>
<tr>
<th>H Market failure</th>
<th>Mode</th>
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<tbody>
<tr>
<td>2.1a Intrinsic appropriation hazards</td>
<td>Discrete</td>
</tr>
<tr>
<td>2.1a Institutional appropriation hazards</td>
<td>Discrete</td>
</tr>
<tr>
<td>2.2 Need for ongoing cooperation</td>
<td>Inter-org</td>
</tr>
<tr>
<td>2.3 Institutional legitimacy</td>
<td>Inter-org</td>
</tr>
<tr>
<td>2.4 Scope of resource exchange</td>
<td>Inter-org</td>
</tr>
<tr>
<td>2.5 Discrete exchange mode experience</td>
<td>Discrete</td>
</tr>
<tr>
<td>2.6 Safeguarding capabilities</td>
<td>Inter-org</td>
</tr>
<tr>
<td>2.7a Independent reconfiguration ability</td>
<td>Discrete</td>
</tr>
<tr>
<td>2.7b Inter-organizational reconfiguration ability</td>
<td>Inter-org</td>
</tr>
</tbody>
</table>

3. Alliances versus acquisitions

<table>
<thead>
<tr>
<th>H Scope of market failure</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>3.1a Appropriation hazards</td>
<td>Acquisition</td>
</tr>
<tr>
<td>3.1b Need for ongoing cooperation</td>
<td>Acquisition</td>
</tr>
<tr>
<td>3.1c Institutional legitimacy</td>
<td>Acquisition</td>
</tr>
<tr>
<td>3.2 Scope of resource exchange</td>
<td>Acquisition</td>
</tr>
<tr>
<td>3.3a Mode experience</td>
<td>Relative</td>
</tr>
<tr>
<td>3.3b Acquisition reconfiguration ability</td>
<td>Acquisition</td>
</tr>
<tr>
<td>3.3c Alliance reconfiguration ability</td>
<td>Alliances</td>
</tr>
<tr>
<td>3.4 Weak resource relevance</td>
<td>Alliances</td>
</tr>
<tr>
<td>3.5 Safeguarding capabilities</td>
<td>Alliances</td>
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<tr>
<td>3.6 Lower target resources proportion</td>
<td>Alliances</td>
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<tr>
<td>3.7a Uncertainty</td>
<td>Alliances</td>
</tr>
<tr>
<td>3.7b Goal centrality</td>
<td>Acquisition</td>
</tr>
</tbody>
</table>

4. Contextual factors

<table>
<thead>
<tr>
<th>H Mode</th>
<th>Mode</th>
</tr>
</thead>
<tbody>
<tr>
<td>4.1 Mode cost</td>
<td>Relative</td>
</tr>
<tr>
<td>4.2 Time pressure for change</td>
<td>External</td>
</tr>
<tr>
<td>4.3 Mode availability</td>
<td>Relative</td>
</tr>
</tbody>
</table>
### Table 3a. Examples of Desired Changes for the Corporate Client Segment Of The Information Communication Technology (ICT) Business

(Labels refer to interviews with managers of firms A to H; we conducted interviews with three managers of firm F and two managers of firm G)

<table>
<thead>
<tr>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Organization: Organizational challenge are recruiting fast decision making processes, 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.</td>
<td>F3: Organization: We want to be a knowledge-sharing organization so that we can provide integrated products in a timely fashion.</td>
</tr>
<tr>
<td>B: Products: We want to become a one-stop shop; to offer more IP private network, IP connectivity, access to ISP.</td>
<td>G1: Organization: In face of increased competition, we need to be much faster at changing our core business. We are too much techno/product driven, while we need to be more customer focused and develop value proposition. We still need to push costs down, although in Europe, we are the best of the incumbents in this area (but not sufficient)</td>
</tr>
<tr>
<td>B: Organization: We need to change our behavior (customer friendly; from subscriber to client mentality) and to change the reward system</td>
<td>G2: Organization: We used to be focused on technology and product/network and be geographically focused. We recently change our structure to be more customer-oriented.</td>
</tr>
<tr>
<td>D: New products and markets: The goal of our joint venture is to provide global products. We need local partnership to build customer relationship and share risks in the country (customer base, domestic product, political connection)</td>
<td></td>
</tr>
<tr>
<td>D: Organization: Our parent strategy was to have a joint venture in each major market in Europe.</td>
<td></td>
</tr>
<tr>
<td>F2: Products: We want to move upward across service value chain up to the point where you have to deliver specific IP applications on WAN; we are just able at the moment to deliver generic application. The discussion of the type of diversification is not yet finalized. But we want to move upward and since this business is the most attractive in the market (less and less potential for value added in the infrastructure segment).</td>
<td></td>
</tr>
<tr>
<td>F2: Organization and processes: The firm has gone through a major internal restructuring including processes, interaction with clients, profit/loss responsibility. The major goal of this restructuring is to be more customer-oriented, more transparent and to develop accountability.</td>
<td></td>
</tr>
</tbody>
</table>
### Table 3b. Examples Of Targeted Resources Needed for the Corporate Client Segment Of The Information Communication Technology (ICT) Business

<table>
<thead>
<tr>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: Marketing &amp; managerial: To become an information service provider, the organizational challenges are to find good people in IT, marketing skills with broader responsibility, and to develop fast decision making processes. A: Marketing: The most important skills such as negotiation, customer orientation, market knowledge, product positionning. A: Managerial: We need to develop an IT profile to recruit, and develop relations with regulatory bodies. A: R&amp;D: Engineers with a general view of network architecture</td>
<td>G1: R&amp;D: In terms of IP network technology, we are far behind compared to U.S. firms. G1: Managerial: We need to develop an entrepreneurial spirit and risk taking attitude. We need to develop a capability of managing joint ventures and acquisitions.</td>
</tr>
<tr>
<td>B: Managerial: People in our firm tend to have a good knowledge of the business but the weakest point is the general management level.</td>
<td>G2: Marketing: Our intended core skills include handling the customer; bringing the components of the services on behalf of the customer</td>
</tr>
<tr>
<td>C: Marketing: We need to provide commercial skills to technical staff and to new staff and develop customer service through training; C: Managerial: 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; We need skills to manage legal affairs such as relationships with staff, competitors, property rights.</td>
<td></td>
</tr>
<tr>
<td>D: R&amp;D: We are facing voice and data convergence through IP network. We have difficulties in managing this convergence D: Marketing: To propose local products we need local partnership to build customer relationship and share risks in the country (customer base, domestic product, political connection</td>
<td></td>
</tr>
<tr>
<td>F1: Marketing: The main field on which telecom operators can compete/distinguish themselves is services they supply to their customers, driven by an excellent IT driven customer care system. Hence, it is important that the telecom operator has good marketing people in house, who are knowledgeable about the products/services they sell and also the whole IT customer care system. Often, marketers lack the latter skills. F2: R&amp;D and marketing: We need to develop new resources to develop an integrated portfolio of services. In IP business, we need additional technical skills and commercial skills beyond just selling the infrastructure</td>
<td></td>
</tr>
</tbody>
</table>
Table 4.1. Internal Versus External Modes Of Change for the ICT Business (11 interviews at 8 firms)

<table>
<thead>
<tr>
<th>P1. Resource relevance: The greater the relevance of a changing firm’s existing resources to the targeted resources, the more likely the firm will use internal development rather than external modes to undertake a change.</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1.1 Resource closeness</strong></td>
<td>A: 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 specialised in internet and carrier products. The key point is to hire key people.</td>
<td>G1: E-commerce is going to have a profound impact on business models in terms of cost reduction, time acceleration, and wider reach. To some extent, it is like moving into a consulting activity where we need to understand the key business driver of each of our customers in terms of customer relationships, internal collaboration with resources, and external relationships across the value chain.</td>
</tr>
<tr>
<td>Hypothesis 1.1: The closer the targeted resources are to the changing firm’s existing resources, the more likely the changing firm will use internal development rather than external modes to undertake a change.</td>
<td>B: In 1994, among 26,000 people, just 800 held a university degree; now 2,500 hold a university degree. We have hired many commercial, marketing, and legal staff.</td>
<td>G1: 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.</td>
</tr>
<tr>
<td>D: Marketing is key. Our joint venture has just recruited a new customer service vice president from the U.S. market;</td>
<td>E: 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.</td>
<td></td>
</tr>
<tr>
<td>F2: There is a huge gap between the skills we need to deliver an integrated offering in the ICT business and our current competencies. To deliver such an integrated portfolio, we need 80% IT competencies versus 20% traditional telecom competencies.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **Implications for H1.1** | • Support  
• Hiring new people is a common mode of obtaining resources that are far away from the changing firm’s resources  
• When the gap between the targeted resources and the changing firm’s resources is very wide, firms tend to acquire critical mass of the needed resources through alliances or acquisitions. | |
### 1.2 Resource strength

**Hypothesis 1.2:** The stronger the changing firm’s resources in the targeted resource area, the more likely the changing firm will use internal development rather than external modes to undertake a change.

<table>
<thead>
<tr>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>A:</strong> We do not have many good people who are able to analyze the traffic or the competition. Traditionally, we surveyed the residential segment by direct mail. The major challenge is to find good people. In our firm, 25% of our people have been hired away from the incumbent.</td>
<td></td>
</tr>
<tr>
<td><strong>F2:</strong> Our main competitors in the IT business are three U.S. firms. Such firms enter the ICT business with a set of competencies that stand more closely to business demand. Compared with us, these firms are capable of translating a business demand into a client solution while we are able only to provide a network solution; providing an integrated solution of one stop shopping; and communicating with the client about the business process. They have built a culture in which they are closer to the business demand, providing the technical skills to manage the different blocks of the process and the interface.</td>
<td></td>
</tr>
<tr>
<td><strong>F2:</strong> We are coming from the infrastructural market of wide area networks (WAN). Several U.S. firms do not have the technical skills in WAN, but they are better at building interface across the blocks, integrating the entire process, and managing commercial deals.</td>
<td></td>
</tr>
<tr>
<td><strong>F2:</strong> The role of mainframes is becoming less important, although there is a huge installed base. WAN and LAN are becoming one system, while the desktop is more integrated with networks. Corporate ICT services encompass a range of services across networked environments.</td>
<td></td>
</tr>
<tr>
<td><strong>F2:</strong> We need to develop new resources to develop an integrated portfolio; we cannot do everything on our own. We intend to use different means: hiring, acquisitions, training of internal people. In IP 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.</td>
<td></td>
</tr>
<tr>
<td><strong>F2:</strong> Our advantage is like those of huge commercial banks or insurance firms: knowledge of operating in a service industry with a huge customer base and mass transaction. As an incumbent, we have the legacy of contact with 90% of the domestic customer base, for which we secure high quality. Our customer base still perceives us as a reliable company, but this reliability has to be proved. Newcomers do not have this legacy.</td>
<td></td>
</tr>
<tr>
<td><strong>G1:</strong> We have key resources for e-commerce: Brand name, customer base, and financial resources. Connectivity and infrastructure will be part of our offering, although we can deliver competitive advantage without owning the infrastructure. We have to figure out how we can create value by combining components and infrastructure, by bringing new intelligence in the network.</td>
<td></td>
</tr>
<tr>
<td><strong>G2:</strong> We have key advantages to address the SME segment in terms of technological capabilities, supplier leverage, brand name, trust, customer base, and customer and contact (on average, 20 contacts a year). However, the main obstacle is the customer perception of what we do; for them, we are a telephone company.</td>
<td></td>
</tr>
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</table>

#### Implications for H1.2

- **Support**
  - The weakness of the changing firm’s resources relative to the targeted resources is an important motivation to pursue external modes of resource acquisition.
  - Resource strength in both the focal resource area and in non-focal resource areas matter and can help. A firm with no particular resources in the focal area will find it easier to acquire resources from the outside if it has strengths in other areas. Having a reputation in some resource areas helps overcome the liability of newness that a firm, even established, can face in a distant resource area, so long as the reputation does not come from a resource area that conflicts with the targeted resources.
**1.3 Mode experience**

Hypothesis 1.3a. The greater the changing firm’s internal development experience, the more likely the changing firm will use internal development rather than external modes to undertake a change.

Hypothesis 1.3b. Past some point of internal development experience, the greater the changing firm’s internal development experience, the more likely the changing firm will use external modes to undertake a change.

<table>
<thead>
<tr>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: We use internal development and hiring to grow. We develop a coaching process to train new people.</td>
<td>F3: No sole part within our firm can mobilize the knowledge that is necessary to provide integrated services. We need both internal and external partners. We want to develop a strand strategy on networking that consists of selecting partners with new and/or different knowledge; involving partners who are good in product development, learning, and marketing; selecting key innovators inside and outside our firm; and connecting with other initiatives inside and outside our firm.</td>
</tr>
<tr>
<td>B: We have both built our competencies in-house or acquired them from outside. Ultimately, we want to have them all in-house.</td>
<td>G1: In the case when we do not manage to acquire resources on labor markets or from other firms, we experiment internally; we experiment, fail, learn. We develop the strategy by doing by ourselves, by refining our practices within a very loose framework.</td>
</tr>
<tr>
<td>F2: We need to develop new resources to develop an integrated portfolio, but we cannot do everything on our own. We intend to use different means: internal hiring, acquisition, and training of internal people.</td>
<td>G2: We have superb technical skills on the engineering side and internal people tend to think that we they should be given a chance to go on their own. We really need to break this perception barrier. Mental barriers include the tendencies to do everything by our own, to focus on technological skills, and to believe that our business is about controlling costs.</td>
</tr>
</tbody>
</table>

**Implications for H1.3**

- **Support**
- There is some evidence of path dependency, but firms tend to be aware of the need to use alternative modes of internal and external modes to obtain the diversity of resources they want.
- There also seems to be a strong recognition of the limits inherent to internal development.
### 1.4 Internal resource linkages and reconfiguration routines

**Hypothesis 1.4a:** The more internal resource linkages there are among a changing firm’s existing resources, the more likely the firm will use internal development rather than external modes to undertake a change.

A: There is still a lack of connection between technical and marketing people. Technical people tend to do research that does not translate to additional revenue or cost reduction.

B: We are implementing a major internal change plan. We are reshaping the SBU and we reduced the number of layers.

C: You can always recruit external experts. The most difficult thing is to make internal people change; 98% of our staff consists of civil servants. There is a natural replacement through retirement and early retirement programs.

**Hypothesis 1.4b:** The stronger a changing firm’s internal reconfiguration routines, the more likely the firm will use internal development rather than external modes to undertake a change.

B: 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.

C: We need to develop an organizational capability to work in a lateral/integrative way across units. We need vertical competencies that integrate the commercial and technical areas.

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### Implications for H1.4

- Support
- Internal resources linkages and processes tend to be difficult to disentangle
- Mechanisms for linking resources are often mentioned, such as personnel rotation and information sharing systems.
- Key processes involve dynamic reconfiguration, such as divestiture of obsolete resources, coaching and socialization processes, and reduction of bureaucracy

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### Unstructured interviews

6

### Semi-structured interviews

F3: In the past years, we have developed many initiatives to improve added value in products and services. The way we carried out these activities had much to do with combining corporate knowledge and ideas in a cross-functional way. Nowadays we should call these activities knowledge management activities. We have developed a knowledge management initiative task force, which is an internal joint venture between our research center and our applications unit. This taskforce employs 325 consultants from our highly trained staff. The objective is to manage knowledge across units.

F3: To develop an integrated offer to our customer, we need to integrate services so that we recombine knowledge across the 23 services that we previously offered.

F3: We need to develop a knowledge sharing culture, with project management skills, interdisciplinary teams, and integrated data bases. We are very hierarchical; we need to develop more flexibility.

F3: Transversal coordination is key to make money out of an idea that come from a specific unit. The issue is really how to bring knowledge together to bring one solution to the customer.

F3: We have a long history of not sharing knowledge. To overcome this culture, we have developed systems of incentives to improve transversal collaboration. For example, each consultant in the knowledge management unit has the obligation to share and report knowledge (for example, through workshop) in at least three different services among our 23 services. The people receiving the knowledge assign scores to the learning they receive and describe how they can use this new knowledge.

F3: To develop an innovation and sharing knowledge culture, we have created interactive workshops, knowledge maps, skills inventories, Best Practices databases, intranet chats, and discussion groups.

G1: Can we transform our skills? So far, we have been good at transforming ourselves relatively speaking, as an incumbent. However, we have not been very good at dealing with new technological waves (e.g., mobile, Internet Protocol); as a fixed incumbent operator, we have missed these opportunities.

G2: We do have physical capabilities but we do not have the process skills. We are not fast enough at developing internal systems and processes (3-5 years). Speed to market matters when you move into the desktop service business.
<table>
<thead>
<tr>
<th><strong>1.5 External linkages and importation reconfiguration routines</strong></th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1.5a: The fewer external resource linkages that a changing firm has with other organizations, the more likely the firm will undertake internal development rather than external modes to undertake a change.</td>
<td>F1: We face the problem of not being able to attract good marketers from outside, because we must recruit from inside the organization (which wants to go from 32,000 to 15,000 employees). Inside the organization one finds mainly technology-focused people, rather than good marketers.</td>
<td>F3: The main goal is to support our firm in an external network and to support organizational change within our firm. The expected benefits include learning faster (joint product development, joint commercial approach); creating a strong community that knows its members, has a common goal, and shares knowledge for a mutual benefit; achieving quick introduction in client environments.</td>
</tr>
<tr>
<td>Hypothesis 1.5b: The stronger a changing firm’s importation reconfiguration routines, the more likely the firm will use external modes rather than internal development to undertake a change.</td>
<td>F1: The real competition for telecom operators/IT companies is taking place in the labour market.</td>
<td>G1: One of the key issue is how to attract and retain the best people, in competition with newcomers.</td>
</tr>
<tr>
<td></td>
<td>F2: We made a huge campaign in the IT field given the shortage of IT people. We are trying to build a IT profile (e.g., advertising in IT companies). The alliance with a large U.S., software house is one of the move in that area; our partner is active in the applications area.</td>
<td>G1: We need to develop a capability to manage alliances and acquisitions. The issue is how you bring such process skills into our people mindset.</td>
</tr>
<tr>
<td></td>
<td>F2: We need to change our profile towards the customer and we need to increase our specific marketing expertise.</td>
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</tr>
<tr>
<td><strong>Implications for H1.5</strong></td>
<td>• Support</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• The capability of importing external resources is critically important in a context of shortage of supply.</td>
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<tr>
<td></td>
<td>• In face of a shortage of external supply (e.g., IT people), attracting people is difficult as the firm faces the liability of business newness. Such liability of newness also holds for incumbents that do not benefit from a reputation in the specific targeted area. Incumbents can suffer from administrative heritages that make them less attractive compared with newcomers.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Usually, the ability to attract external resources requires internal changes to create a more appropriate profile. There can be a vicious spiral in which a firm will not be able to attract external resources as long as it does not have a certain level of these resources internally. Alliances and acquisitions can be ways to overcome this liability of newness.</td>
<td></td>
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</tbody>
</table>
### 1.6 Resource conflict and semi-autonomous subunits

| Hypothesis 1.6a: The more the changing firm's existing resources will conflict with targeted resources, the less likely the changing firm will use internal development rather than external modes to undertake a change. |

- **C:** We do not have resource problems in the basic technological field, but the boom in data traffic raises internal political and resource allocation issues, because we used to manage the data traffic in a separate subsidiary at the periphery of the core business. There are two types of technologies: the circuit technology for voice traffic and the packet technology for data traffic. For a long time, most research funds were devoted to the dominant activity, the circuit technology, but internet development challenges this logic. 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. Solutions to deal with increasing data traffic would be to add, in parallel, a separate network that is better adapted to data traffic or to upgrade the existing network to integrate both voice and data traffic.

| Hypothesis 1.6b: The more the changing firm's existing resources will conflict with targeted resources in cases for which the firm uses internal development, the more likely the firm will create a semi-autonomous subunit to develop the targeted resources. |

- **F2:** Over time, the regional units had built up a strong power base within the firm. Forced by the market, we have limited the power of this unit. The new structure reinforces the role of business units. Production units are forced to supply the demand of business units. The different SBUs buy network capacity from production units, for example. We have stresses associated with the new structure: reduction of regional unit power; high resistance, and realocating people when historical relationships have built up.

- **H:** We are the first incumbent to sell a voice Internet Protocol (IP) 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.

- **H:** 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.

### Implications for H1.6

- **Support**
- **Targeted resources often conflict with the changing firm’s existing resources.** Conflicting targeted resources meet problems of internal legitimacy (employee acceptance) and of external legitimacy (customer acceptance), that are mutually reinforcing.
- **When developed within the firm, firms often develop conflicting targeted resources outside of the original organization.** However, the independent unit that provides a home for the conflicting targeted resources has a very unstable position as a form of internal joint venture; the independent unit must deliver quick results, cannot fully benefit from the corporate resources, and so aims at gaining more organizational importance.

### Unstructured interviews

**C:** We do not have resource problems in the basic technological field, but the boom in data traffic raises internal political and resource allocation issues, because we used to manage the data traffic in a separate subsidiary at the periphery of the core business. There are two types of technologies: the circuit technology for voice traffic and the packet technology for data traffic. For a long time, most research funds were devoted to the dominant activity, the circuit technology, but internet development challenges this logic. 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. Solutions to deal with increasing data traffic would be to add, in parallel, a separate network that is better adapted to data traffic or to upgrade the existing network to integrate both voice and data traffic.

### Semi-structured interviews

**G1:** We created the E-business unit one month ago. At the moment, this unit does not fit very well with our organization and the dominating division. We have to operate differently from the core business because the e-business operates in a very different environment from our core business. Key questions are whether we should separate from the main unit and whether we should expand globally. There is also a tradeoff between our cash cow business and new opportunities, with conflicting objectives.

**G2:** As an incumbent, we have key advantages to address the SME segment. The main obstacle is the customer perception of what we do: for them, we are telephone company. We need to break out this perception. People expect us to develop services slowly. It is hard for us to understand the SME segment, which has a huge disparity of firm scale.

**G2:** Internally, several mental barriers need to be addressed, including trying to do everything on our own, focusing on technological skills, and emphasizing controlling costs.
<table>
<thead>
<tr>
<th><strong>1.7 Scope of change</strong></th>
<th>Unstructured interviews and semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 1.7. The greater the scope of change, the more likely a changing firm will use external modes of change.</td>
<td>A, E, F2: Discussion arose in the context of H1.1 and H1.2 (resource closeness and resource strength)</td>
</tr>
</tbody>
</table>

**Implications for H1.7**

- Support
- The more business dimensions that a change affects, the more likely firms are to use external modes, typically in combination with internal development
Table 4.2. External Modes Of Change: Discrete Versus Inter-Organizational Modes Of Change for the ICT Business (11 interviews at 8 firms)

**P2. Market failure:** When a changing firm chooses an external mode to obtain resources, the greater the market failure that the resource exchange faces, the more likely the firm will use inter-organizational resource exchange rather than discrete resource exchange to undertake a change.

<table>
<thead>
<tr>
<th>2.1 Appropriation hazards</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 2.1a: The greater a resource exchange faces intrinsic appropriability hazards, the more likely a changing firm will use discrete resource exchange rather than inter-organizational modes to undertake a change.</td>
<td>B: We have built competencies or acquired from outside. Ultimately, we want to have it all in house, with no outsourcing.</td>
<td></td>
</tr>
<tr>
<td>Hypothesis 2.1b: The greater the institutional appropriability hazards that a resource exchange faces, the more likely a changing firm will use discrete resource exchange rather than inter-organizational modes to undertake a change.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Implications for H2.1**

- Little mention during discussions
- While the fear of knowledge appropriation has been raised as a main issue in the alliance cases we report, firms did not raise it as an overwhelming element in discrete resource exchange. Eventually, the firm will be the owner of the resources that have been bought.
- The process of transaction per se does not occur to be a dominant concern, while the process of definitive internalization is a central concern.
### 2.2 Need for ongoing cooperation

**Hypothesis 2.2:** The greater the need for ongoing cooperation by the provider and user of targeted resources, the more likely a changing firm will use inter-organizational resource exchange rather than discrete resource exchange to undertake a change.

<table>
<thead>
<tr>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>B: In the form of alliances and acquisitions, we want to attract skills and knowledge. We bought a lot of small companies to increase our services, such as in Web design.</td>
<td>G1: There is not much complementarily to be gained from one alliance; it is more a consolidation move than a skill-driven move. With another company that we attempted to ally with, it would have been different; we were looking to capture some of their market aggressiveness.</td>
</tr>
<tr>
<td>D: The corporate cultures of both parents in the alliance were different. Our partner brought a commercial culture: emphasizing “what the customer wants, the customer gets it”; sales drive; creating solutions quickly; many “fix it” activities; and high marketing skills. From a customer service, the US is far advanced compared to us in most industries. By contrast, our culture emphasizes standardized, well-defined activities. Our partner got us to think outside the box, to define markets, to get new segments, to build up the overall local market, then build the European market, and then attack the US and Asian markets.</td>
<td></td>
</tr>
</tbody>
</table>

### Implications for H2.2

- Support
- Managers view alliances and acquisitions as means of obtaining bundles of resources that firms needed to develop new services.
- Intangible elements such as culture, processes, and ways of operating often arise in alliances and acquisitions.
### 2.3 Institutional legitimacy

**Hypothesis 2.3.** The lower the institutional legitimacy of a changing firm, the more likely the firm will undertake inter-organizational modes rather than discrete resource exchange to undertake a change.

<table>
<thead>
<tr>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>A: It is hard to attract specific types of people. We need to develop an image on the market. It is hard to attract people who understand the competencies of the organisation.</td>
<td>G1: A key issue is the impact of the imported skills on our internal skills, our people. It is difficult to balance imported skills with our internal people and context.</td>
</tr>
<tr>
<td>B: The most important skills in the current telecom industry are marketing and sales. It is difficult to attract people who have commercial skills and understand the telecom business. Although we propose good salaries, the problem that we are facing is how to attract people who have the necessary marketing skills. University people are hard to get and having engineers do the marketing job is not always successful. Marketing people have to be people oriented. Many engineers are not like that.</td>
<td></td>
</tr>
<tr>
<td>F1: The real competition among telecom operators/IT companies is taking place in the labour market.</td>
<td></td>
</tr>
<tr>
<td>F2: We made a huge campaign in the IT field given the shortage of IT people; we are trying to build an IT profile.</td>
<td></td>
</tr>
</tbody>
</table>

**Implications for H2.3**

- Support
- External legitimacy is a key element in attracting external resources; Firms do not have equal access to external resources. Firms with a high reputation can overcome some liability of newness in a specific resource area if they have strengths in other areas. However, in the specific resource area, a firm will face an absorptive capacity issue as the lack of a prior resources will make it difficult to absorb and retain the resources. The lack of a critical size in the targeted resource area may lead the firm to go for a more radical approach through alliances or acquisitions.
- Internal legitimacy is also an key element for absorbing external resources.

### 2.4 Scope of resource exchange

**Hypothesis 2.4.** The greater the scope of resource exchange, the more likely a changing firm will undertake inter-organizational modes rather than discrete resource exchange to undertake a change.

<table>
<thead>
<tr>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>E: 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 that customers needed.</td>
<td>G2: Our competitors tend to acquire firms or make alliances to assemble the value chain. We need to have this degree of flexibility.</td>
</tr>
<tr>
<td>F2: We need to develop new resources to develop an integrated portfolio; we cannot do everything on our own. We intend to use different means: internal hiring, acquisition, and training internal people.</td>
<td></td>
</tr>
</tbody>
</table>

**Implications for H2.4**

- Some support
- When firms lack many skills needed to develop a particular resource, they will tend to undertake an acquisition or alliance.
### Unstructured interviews

**Hypothesis 2.5.** *The greater a changing firm’s discrete exchange mode experience, the more likely the firm will use discrete exchange rather than inter-organizational modes to undertake a change.*

<table>
<thead>
<tr>
<th>Implications for H2.5</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Limited support</strong></td>
<td>G2: From the engineering side, we have superb technical skills 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. Our competitors will tend to acquire firms or make alliances to assemble the value chain. We need to have this degree of flexibility.</td>
</tr>
<tr>
<td>Path dependency for discrete resource exchange may occur as a default mode, rather than being an experience enhancing mechanism. The fact of avoiding inter-organizational mode may be an outcome of the lack of skills to manage alliances or acquisitions, rather than as a trade-off between discrete and inter-organizational modes.</td>
<td>G2: We lack the internal ability to develop alliances. It is not so much the skills per se but the attitude. We lack the internal ability to develop alliances. A lot of senior managers still think that we should do everything and do not see alliances as a way to enhance capabilities.</td>
</tr>
<tr>
<td>Firms often view internal development and discrete resource exchange as parts of an inwardly focused mode of change, which also suggests the difficulties that the firm faces to change by itself. In contrast, alliances and acquisitions would bring a different organizational context. To some extent, the failure in the discrete resource exchange may come from the inability of the receiving firm to change its context to graft the resources (internal failure), rather than from the features of the targeted resources (embeddedness). Some resources, even embedded in their context, could be decontextualized and recontextualized if the changing firm could overcome the difficulties to change its own context. In some cases, the use of alliances and acquisitions creates momentum for the changing firm to change its context.</td>
<td>G2: In terms of acquisitions, once again, we do not have 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.</td>
</tr>
</tbody>
</table>
### 2.6 Internal safeguarding capabilities

Hypothesis 2.6: The stronger a changing firm’s internal safeguarding capabilities, the more likely the firm will use inter-organizational modes rather than discrete resource exchange in order to undertake a change.

<table>
<thead>
<tr>
<th>Implications for H2.6</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Did not arise during discussions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 2.7 Independent/inter-organizational reconfiguration ability

Hypothesis 2.7a. The greater a changing firm’s independent reconfiguration ability, the more likely the firm will use discrete exchange rather than inter-organizational modes to undertake a change.

Hypothesis 2.7b. The weaker a changing firm’s inter-organizational reconfiguration ability, the more likely the firm will use discrete exchange rather than inter-organizational modes to undertake a change.

<table>
<thead>
<tr>
<th>Implications for H2.7</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Support</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• There is frequent recognition that firms must undertake internal changes such as developing new reward systems and coaching processes, if they want to acquire external resources. In the coaching process, for example, firms have to decontextualize and recontextualize the acquired resources.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• These internal changes may not be sufficient to attract discrete resources. In that case, firms will have to ally or acquire firms to gain access to a different organizational context.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• However, even in the context of alliances and acquisitions, it is difficult to learn from others. Some firms can be better at designing mechanisms to increase their ability to learn from partners or targets.</td>
<td></td>
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</tr>
</tbody>
</table>
Table 4.3. Inter-Organizational Modes Of Change for the ICT Business: Alliances Versus Acquisitions (11 interviews at 8 firms)

<table>
<thead>
<tr>
<th>P3. Scope of market failure: When a firm chooses an inter-organizational resource exchange mode to undertake a change, the greater the scope of market failure, the more likely the changing firm will use business acquisitions rather than alliances.</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3.1 Market failures</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hypothesis 3.1a. The greater the appropriation hazards of a resource exchange, the more likely a changing firm will use business acquisitions rather than alliances to undertake a change.</td>
<td>D: The margin on the JV products is lower than the margin on domestic growth. The parents focused the best people on the domestic market. D: We are facing voice and data convergence through IP network. We have difficulties in managing this convergence. Nobody knows what’s going on. And at the same time, you still have to maintain the traditional platform. Overall, there is a high level of turnover across joint venture and parent firms; a challenge for our joint venture is to keep people, to ensure more stability vis-a-vis the parent companies.</td>
<td>G1: The choice of a JV depends on how core it is for us (if it is important for us to control the outcome) and management control.</td>
</tr>
</tbody>
</table>
| Hypothesis 3.1b. The greater the need for ongoing cooperation by the provider and user of targeted resources, the more likely a changing firm will use business acquisitions rather than alliances to undertake a change. | | G2: There is a fear that our partner will capture our commercial advantage, which is the value of the relationship we have with our customers. Over time, our partner is likely to enter our market. There is a perception that we will compete with our partner at the end of the contract. Many senior managers still think that we should do everything and do not see alliances as a way to enhance capabilities. They tend to see alliances more as a route to diminishing skills. Of course, this risk must be assessed. There is a risk of diminishing the value of our relationship with the customer as we provide our partner with the opportunity to be in contact with our customers. People often think that “These guys are going behind our back; they let a competitor enter our business”.
| Hypothesis 3.1c. The lower the institutional legitimacy of a changing firm, the more likely the firm will use business acquisitions rather than alliances to undertake a change. | | |
| **Implications for H3.1** | • Support concerning appropriation hazards | • The fear of losing knowledge in the alliance is a key issue. Termination uncertainty is a major issue. |

<table>
<thead>
<tr>
<th>3.2 Scope of the resource exchange</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hypothesis 3.2.: The greater the scope of resource exchange, the more likely a changing firm will use acquisitions rather than alliances to undertake a change.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Implications for H3.2</strong></td>
<td>Did not arise during discussions</td>
<td></td>
</tr>
</tbody>
</table>
### 3.3 Mode experience

**Hypothesis 3.3a.** The greater a changing firm’s experience with an inter-organizational mode, the more likely the will use that mode to undertake a change.

**B:** Our alliance with three telecom firms from Europe, Asia, and the United States aimed at sharing costs, knowledge and for geographic expansion.

**B:** From 1996 onwards, we have invited ‘expats’ from three strategic partners to help us in the changing process towards a vital competitor.

**B:** 100 expatriates from our U.S. partner were sent to us, 60 from our European partner, and a few from our Asian partner. These expats helped us develop our customer satisfaction policy, create process tools to develop the organization, undertake reengineering, forecasting, provisioning, international traffic, fixed mobile convergence, project management knowledge.

**C:** Our alliance with two firms from Europe and the U.S. is not very successful; at best, we exchange information; but at the moment, there is no knowledge sharing that happens.

**Hypothesis 3.3b.** The stronger a changing firm’s acquisition reconfiguration capabilities, the more likely the firm will use acquisitions to undertake a change.

**G1:** The choice of a JV depends on whether we can bring back the success into our organization.

**G2:** We lack the internal ability to develop alliances. It is not so much the skills per se but the attitude. We lack the internal ability to develop alliances. A lot of seniors still think that we should do everything and do not see alliances as a way to enhance capabilities.

**G2:** In terms of acquisition, once again, we do not have 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 that skills or fail. [A specific U.S. firm] is a striking example of such a capability.

**F3:** It is important to cooperate among partners of the alliance and to develop joint projects. We first started to do an inventory of people and competencies involved in this alliance. We create a data base to share this information. We try to classify the different types of competencies. For example, in the IT area, we developed the classification of project leader, system engineer, development, maintenance, and designer.

**F3:** People in the technical areas are more likely to share their experience; they like scientific research and tend to have a strong community of interest, although the not-invented-here syndrome can be present. 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!

**F3:** It is also important to take advantage of the emergent projects that arise from collaboration and can help increase our learning.

**Hypothesis 3.3c.** The stronger a changing firm’s alliance reconfiguration capabilities, the more likely the firm will use alliance to undertake a change.

**Implications for H3.3**

- Support
- Systematized practices of alliances or acquisitions represent incentives to choose modes of change.
- Firms tend to measure the performance of an alliance according to the degree to which firms share knowledge.
- Sharing of knowledge varies across resource areas, depending upon their sharing of a community of interests.
- Operating systems such as inventory, codification, and staff rotation seem to be enforced in alliances driven by resource sharing.
<table>
<thead>
<tr>
<th>3.4 Resource relevance</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothesis 3.4:</strong> The less relevant the changing firm’s existing resources are to the targeted resources, the more likely the firm will use alliances rather than business acquisitions to undertake a change.</td>
<td>D: Our strategy was to have a JV in each major market in Europe. The goal was to provide global products for MNE, but at the same time we recognize that we need local partnership to build customer relationships and share risks in the country. Limits in our existing customer base, domestic products, and political connections influence the approach.</td>
<td>G1: We have developed a pilot project with a U.S. firm for IT support; we lack the total set of skills.</td>
</tr>
</tbody>
</table>

**Implications for H3.4**
- Some support
- Firms that are not familiar with the targeted resources will tend to conduct an alliance rather than an acquisition. This may be particularly relevant when firms cross borders and want to gain access to locally-embedded resources (e.g., networks, customer contact) that they cannot yet manage by themselves.

<table>
<thead>
<tr>
<th>3.5 Safeguarding capabilities</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothesis 3.5:</strong> The stronger a changing firm’s safeguarding capabilities, the more likely the firm will use alliances rather than business acquisitions in order to undertake a change.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Implications for H3.5**
Did not arise during discussions
### 3.6 Target resource proportion

**Hypothesis 3.6.** The smaller the target resource proportion within other firms, the more likely a changing firm will use an alliance rather than an acquisition to undertake a change.

<table>
<thead>
<tr>
<th>Implications for H3.6</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Did not arise during discussions</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### 3.7 Retractability

**Hypothesis 3.7a:** The greater the uncertainty, the more likely a changing firm will use an alliance rather than a business acquisition to undertake a change.

**Hypothesis 3.7b:** The more central the target resources are to the changing firm’s long term goals, the more likely the firm will use a business acquisition rather than an alliance to undertake a change.

<table>
<thead>
<tr>
<th>Implications for H3.7</th>
<th>Unstructured interviews</th>
<th>Semi-structured interviews</th>
</tr>
</thead>
</table>
| • Reversibility of commitment can be valuable in situations where there is uncertainty about the future value of the targeted resources and when resources are peripheral. | | G1: Should we experiment outside of our company? We have different processes; a joint venture might be appropriate for this type of uncertain market. A JV reduces the risk, but also the payback.  
G1: The choice of a JV depends on the level of uncertainty (what we need to do is not known).  
G2: We have a data warehouse with our partner; we could do that internally but we do not have a long-term ambition in the domains of hardware or software. *(Allows reversible commitment).* |

G1: Should we experiment outside of our company? We have different processes; a joint venture might be appropriate for this type of uncertain market. A JV reduces the risk, but also the payback.

G1: The choice of a JV depends on the level of uncertainty (what we need to do is not known).

G2: We have a data warehouse with our partner; we could do that internally but we do not have a long-term ambition in the domains of hardware or software. *(Allows reversible commitment).*
<table>
<thead>
<tr>
<th><strong>Table 4.4. Contextual Factors Influencing Modes of Change for the ICT Business (11 interviews at 8 firms)</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>4.1 Relative cost</strong></td>
</tr>
<tr>
<td><em>Hypothesis 4.1</em>: The greater the cost of using a mode to undertake a change, the more likely a changing firm will favor other modes to undertake a change</td>
</tr>
<tr>
<td>G1: 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 is: How costly? The choice of a JV depends on cost.</td>
</tr>
<tr>
<td><strong>4.2 Time pressure for change</strong></td>
</tr>
<tr>
<td><em>Hypothesis 4.2a</em>: The greater the time pressure for change, the more likely a changing firm will use external modes to undertake a change.</td>
</tr>
<tr>
<td>G1: One of the main criteria concerning choosing between acquisitions and alliances is how fast we need to be.</td>
</tr>
<tr>
<td><em>Hypothesis 4.2b</em>: The greater the time pressure for change, the more likely a changing firm will use an inter-organizational modes rather than discrete resource exchange to undertake a change.</td>
</tr>
<tr>
<td>G2: We are not fast enough at developing internal systems and processes (3-5 years). When you move into the desktop service business, speed to market matters</td>
</tr>
<tr>
<td><strong>4.3 Availability of alternatives, legal constraints</strong></td>
</tr>
<tr>
<td><em>Hypothesis 4.3a</em>: lower the externally availability of the targeted resources, the more likely a changing firm will use internal development of resources to undertake a change</td>
</tr>
<tr>
<td>A: In Europe, it is hard to find good people. In the U.S., the market developed 8 years ago and was booming 5 years ago. You can find now a lot of people good at sales in this industry</td>
</tr>
<tr>
<td><em>Hypothesis 4.3b</em>: The lower the availability of potential partners, the more likely a changing firm will use discrete resource exchange rather than inter-organizational modes to undertake a change.</td>
</tr>
<tr>
<td>G1: It is not easy to get people on external markets; there is a shortage and high competition. The issue for us of getting people is not financial, but the ability to offer an attractive environment. In the case when we do not manage to acquire resources on labor markets or from other firms, we experiment internally; we experiment, fail, learn.; we develop the strategy by doing by ourselves, by refining our practices within a very loose framework.</td>
</tr>
<tr>
<td><em>Hypothesis 4.3c</em>: The greater the relative availability of potential acquisition targets and potential allies, the more likely a changing firm will use the more available inter-organizational mode to undertake a change.</td>
</tr>
<tr>
<td>G2: There are regulatory constraints. Obstacles of developing the SME business within our firm include cross-subsidy problems, issue of picking up and choosing customer, price discrimination issues (we cannot discriminate or do special deals as our competitors do; we have to charge a single price to anybody, while price sensitivity is high in the SME segment).</td>
</tr>
<tr>
<td><strong>Implications</strong></td>
</tr>
</tbody>
</table>
Appendix 1. Concepts and Definitions

<table>
<thead>
<tr>
<th>Sct</th>
<th>Concept</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Change</td>
<td>Alteration to what a firm is able to do or how the firm undertakes its activities; resource transformations that entail development of new products, new productive processes, new market, or creation of a new organizational structure or modification of significant parts of the existing organizational structure.</td>
</tr>
<tr>
<td>1</td>
<td>Changing firms</td>
<td>Firms that have initiated a search process for new resources</td>
</tr>
<tr>
<td>1</td>
<td>Institutions</td>
<td>Established ways of doing things that cause pressures for social conformity</td>
</tr>
<tr>
<td>1</td>
<td>Modes of change</td>
<td>Internal development, discrete resource exchange, alliances, acquisitions</td>
</tr>
<tr>
<td>1</td>
<td>Relevant resources</td>
<td>Existing resources that provide the skills needed to undertake desired changes (resource closeness, resource strength, path dependency, xx)</td>
</tr>
<tr>
<td>1</td>
<td>Resource exchange</td>
<td>Obtaining resources from outside the firm.</td>
</tr>
<tr>
<td>1</td>
<td>Resource reconfiguration</td>
<td>Recombining and adding to existing routines in order to create new resources</td>
</tr>
<tr>
<td>1</td>
<td>Resources</td>
<td>Stocks of knowledge, skills, financial assets, physical assets, human capital, and other tangible and intangible factors; consist of sets of routines</td>
</tr>
<tr>
<td>1</td>
<td>Routines</td>
<td>Identifiable patterns of activity embodied in human or capital assets</td>
</tr>
<tr>
<td>1</td>
<td>Targeted resources</td>
<td>Resources that a firm must obtain in order to undertake a desired change</td>
</tr>
<tr>
<td>2.1</td>
<td>Change process capabilities</td>
<td>The ability of the firm to manage the process of resource reconfiguration, independent of the nature of the resources</td>
</tr>
<tr>
<td>2.1</td>
<td>External resource linkages</td>
<td>The direct and indirect linkages of a given firm with other organizations and people; includes number and intensity of linkages; the linkages function as inter-organizational routines</td>
</tr>
<tr>
<td>2.1</td>
<td>Importation reconfiguration routines</td>
<td>Systems that a firm has created that allow it to import resources from external sources and then recombine them with existing routines in order to create new resources.</td>
</tr>
<tr>
<td>2.1</td>
<td>Internal reconfiguration routines</td>
<td>Systems that a firm has created that allow it to recombine and add to existing routines in order to create new resources.</td>
</tr>
<tr>
<td>2.1</td>
<td>Internal resource linkages</td>
<td>The degree to which different resources share common routines.</td>
</tr>
<tr>
<td>2.1</td>
<td>Mode experience</td>
<td>The extent to which the changing firm has engaged in a mode of change in the past, where extent includes the frequency of experience, how much the firm has invested, and the success of prior experience</td>
</tr>
<tr>
<td>2.1</td>
<td>Resource closeness</td>
<td>The extent to which two resources share the same routines; closeness to targeted resources is the degree to which the targeted resources will consist of routines that exist within a changing firm's existing set of resources</td>
</tr>
<tr>
<td>2.1</td>
<td>Resource conflict</td>
<td>The degree to which the routines that underlie a firm’s existing resources and the targeted resources are incompatible with each other.</td>
</tr>
<tr>
<td>2.1</td>
<td>Resource strength</td>
<td>The degree to which the routines that make up a firm’s resources suit the targeted resource when compared to other organizations' resources</td>
</tr>
<tr>
<td>2.1</td>
<td>Scope of change</td>
<td>The extent to which a change affects several change dimensions. Includes breadth (number of dimensions of business change) and depth (magnitude of qualitative changes made within an individual dimension of change) of change.</td>
</tr>
<tr>
<td>2.1</td>
<td>Semi-autonomous subunit</td>
<td>A business unit that the firm owns but operates largely independently of other business units.</td>
</tr>
<tr>
<td>2.1</td>
<td>Structural holes</td>
<td>Gaps between between networks of relationships</td>
</tr>
<tr>
<td>2.2</td>
<td>Appropriation hazards</td>
<td>The extent to which it is difficult to specify, monitor, and enforce a discrete resource exchange contract</td>
</tr>
<tr>
<td>2.2</td>
<td>Cooperation by provider and user</td>
<td>Active collaboration in the process of exchanging and reconfiguring resources</td>
</tr>
<tr>
<td>2.2</td>
<td>Independent reconfiguration capability</td>
<td>Capability of undertaking post-exchange reconfiguration without the participation of the provider of a target resource</td>
</tr>
<tr>
<td>2.2</td>
<td>Institutional appropriation hazards</td>
<td>Set of fundamental political, social, and legal ground rules that establishes the basis for production, exchange, and distribution</td>
</tr>
<tr>
<td>2.2</td>
<td>Institutional legitimacy</td>
<td>The degree to which a firm is viewed as a desirable member of a commercial and social community.</td>
</tr>
<tr>
<td>2.2</td>
<td>Inter-organizational reconfiguration ability</td>
<td>A firm’s ability to manage the process of resource reconfiguration following alliances or acquisitions</td>
</tr>
<tr>
<td>2.2</td>
<td>Intrinsic appropriation hazards</td>
<td>Exchange issues that arise because of the tactlessness, co-specialization, or organizational embeddedness of targeted resources.</td>
</tr>
<tr>
<td>2.2</td>
<td>Market failure</td>
<td>Difficulties in attempting to compose, consummate, and enforce arms length agreements to exchange assets; may arise from market failure, potential opportunism, need for cooperation by provider and user of resources, and lack of institutional legitimacy.</td>
</tr>
<tr>
<td></td>
<td>Safeguarding capabilities</td>
<td>A firm’s skill at protecting the value of its property rights; includes issues such as legal skill and ability at protecting secrets, as well as a firm’s network of relationships.</td>
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</tr>
<tr>
<td>2.2</td>
<td>Scope of resource exchange</td>
<td>The number of types of resources that the firm is obtaining</td>
</tr>
<tr>
<td>2.3</td>
<td>Acquisition reconfiguration capabilities</td>
<td>Systems that a firm uses to redeploy resources to and from acquired businesses</td>
</tr>
<tr>
<td>2.3</td>
<td>Alliance reconfiguration capabilities</td>
<td>Systems that a firm uses to learn from its alliances</td>
</tr>
<tr>
<td>2.3</td>
<td>Central to a firm’s long term goals</td>
<td>Resources that the firm expects will influence many aspects its business in the future.</td>
</tr>
<tr>
<td>2.3</td>
<td>Scope of market failure</td>
<td>Greater scope of market failure involves a larger number of resources</td>
</tr>
<tr>
<td>2.3</td>
<td>Target resource proportion</td>
<td>The ratio of desired resources within another firm to the total resources of the other firm</td>
</tr>
<tr>
<td>2.3</td>
<td>Uncertainty</td>
<td>Not knowing what will happen in the future</td>
</tr>
<tr>
<td>2.4</td>
<td>Cost of internal development</td>
<td>Factors ranging from direct investment in physical assets, to governance costs, to learning costs, to organization costs</td>
</tr>
<tr>
<td>2.4</td>
<td>External resource availability</td>
<td>The existence of external resources and potential partners, as well as institutional limits such as laws and norms that reduce tradability.</td>
</tr>
<tr>
<td>2.4</td>
<td>Partner availability</td>
<td>Depends on factors such as the number of firms that operate in a market, the number of existing relationships that other firms have formed, and laws and norms that constrain the use of particular modes</td>
</tr>
<tr>
<td>2.4</td>
<td>Time pressure for change</td>
<td>Perceived need to undertake a change quickly; sources include external competitive pressure and intrinsic internal desires to change quickly.</td>
</tr>
</tbody>
</table>
Appendix 2. Semi-Structured Interview Questions

Product-Market Focus: Corporate Client Segment of the Information Communication Technology (ICT) Business

A. Background Understanding
1. What technological, competitive, market, and financial challenges is your firm currently facing?
2. In regard of these challenges, how has your strategy evolved over the past years?
3. More specifically, what role will your firm play in the ICT business?
4. How do you define the ICT business?
5. In which of the following ICT services areas regarding the corporate client segment do you currently operate?
   - Ensuring an integrated environment with optimal interfaces (across WAN, LAN, Desktop, mainframe)
   - Designing and operating infrastructure
   - Installing and maintaining hardware
   - Installing and maintaining software
   - Installing and maintaining applications
   - Providing strategic ICT consulting
6. Which service markets do you plan to enter in the next 3 years?
7. In which services does your firm want to be a major player?
8. In each of these services, who are the main players?
9. In each of these services, how important is the time to market entry? Why?
10. In each of these services, what other firms and/or industries have the potential to enter that market? Why?

B. Organisational Background: Structure and Processes
1. Organisational structure
   - Overall structure: corporate, business units, groups, support functions
   - Number of units such as divisions and departments
   - Reporting relationships within and across units
   - Number of management levels
   - Number of people
2. Information exchange
   - Intraorganizational linkages between groups and people
   - Interorganizational linkages between groups/people and external organizations (univ., govt., other firms, consortia, industry groups)
   - task responsibility
3. Human Resources
   - Incentive and reward systems
   - Managerial transience (i.e. how often do mid- and top-level managers change roles or positions)
   - Risk tolerance (tolerance for new ideas, entrepreneurial ventures, extended search)
   - Human resource hiring practices (diversity, quality, etc.)
4. Strategic Planning Process
   - Level at which strategy is initiated
   - Approval process (how much control do senior managers exert on the process)
   - Budgeting and control (how are competing capital projects evaluated and developed?)
5. Other?
C. Market-level Questions: Resources Needed to Compete in the Corporate Client Sector

1. In general, what skills are needed to deliver a competitive service to corporate clients (to ensure competitive prices, differentiated products, a high level of innovation, and effective customer service)?

2. More specifically, could you describe the knowledge and skills needed to be competitive in the Corporate Client Segment along the following dimensions:
   - Technical capabilities (e.g., transport and network equipment, programming and designing, interfaces)
   - Production capabilities
   - Product refinement capabilities
   - Capabilities for development of components and sub-assemblies
   - Commercial/marketing capabilities (e.g., customer segmentation, customer need analysis, solution sales skills, etc)
   - Project management capabilities (e.g., providing an integrated package, bundling services)
   - Managerial capabilities (e.g., employee incentive systems)
   - Financial systems capabilities
   - Other capabilities?

3. What organisational factors are necessary to build or maintain these resources? (see “Org. Background” for more complete descriptions):
   - Organizational Structure
   - Information Exchange
   - Human Resources
   - Strategic Planning Process
   - Other?

D. Firm-Specific Questions: Resources Required in the Corporate Client Segment of the ICT Business

1. In general what skills does your firm need in order to deliver a competitive service to your corporate client (to ensure competitive prices, differentiated products, a high level of innovation, and effective customer service)?

2. More specifically, could you describe the knowledge and skills your firm has and which resources you intend to develop in the following areas:
   - Technical capabilities (e.g., transport and network equipment, programming and designing, interfaces)
   - Production capabilities
   - Product refinement capabilities
   - Capabilities for development of components and sub-assemblies
   - Commercial/marketing capabilities (e.g., customer segmentation, customer need analysis, solution sales skills, etc)
   - Project management capabilities (e.g., providing an integrated package, bundling services)
   - Managerial capabilities (e.g., employee incentive systems)
   - Financial systems capabilities
   - Other capabilities?

3. What organisational changes, if any, have been necessary to enable your firm to build these skills?
   - Organizational structure
   - Information exchange
   - Human resources
   - Strategic planning process
   - Other?
E. Firm-specific Questions: Building Knowledge and Skills in the Corporate Client Segment of the ICT Business

1. Considering the above mentioned skills, how has your firm been able to attract and develop these skills through the following possible mechanisms:
   - Internal training
   - Internal product development
   - Hiring external people
   - Acquiring specific knowledge on the market (e.g., license, software packages, consultants)
   - Setting up an alliance/joint venture business
   - Acquiring a company or business unit

2. How effective have these different mechanisms been in building the targeted skills? What types of situations suit particular mechanisms? Under what conditions would you expect a particular mechanism to be most successful?

3. What have been the challenges and pressures for your firm associated with these mechanisms? Under what conditions would you expect a particular mechanism to cause most stress?

4. What types of costs are associated with each of these mechanisms (e.g., production, transaction, development, opportunity)?

5. What aspects in this process of building new skills, do you consider to be very unique about your firm?

6. If any, what company have you used as a benchmark in the whole process of building new skills?

7. What additional steps in this change process does your firm tend to take in the near or further future?

F. Firm-specific Questions: Protecting and Building Skills

1. When you choose a particular mechanism for acquiring skills, to what extent do you take into account the effect that mechanism will have on protecting the value of skills that you know have or might develop in the future?

2. When you choose a particular mechanism for acquiring skills, to what extent do you need to balance trade-offs between protecting the value of existing skills and developing new skills? In your experience, do some mechanisms provide greater or lesser ability to both protect and develop skills than others?

3. Are there any ancillary skills or capabilities that have developed due to the particular mechanism used to acquire the focal skills? Do you anticipate using these skills in the future? (or have past mechanisms influenced your present choice of mechanisms?).

G. Firm-specific Questions: Abandonment

1. In the market segments that you have chosen not to enter, what are the primary reasons why you did not enter that market? What mechanism to acquire skills were considered and why were they not used?

2. To what extent were the needed skills or capabilities present in labour markets, asset markets, or other firms?