DESIGNING THE BOUNDARIES OF THE FIRM:
FROM “MAKE, BUY OR ALLY” TO THE DYNAMIC BENEFITS OF VERTICAL ARCHITECTURE

Michael G. Jacobides
Assistant Professor of Strategic and International Management
London Business School
Sussex Place, Regent’s Park, London NW1 4SA
Tel: +44 20 77066725; Fax: +44 20 7724 7875
mjacobides@london.edu

Stephan Billinger
University of St.Gallen – Institute of Technology Management
Dufourstrasse 40a, CH-9000 St.Gallen
Tel: +41 71 224 72 52; Fax: +41 71 224 7301
stephan.billinger@unisg.ch

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How do firms design and re-design their boundaries? What motivates these design choices and what is their impact? In studying and working with a major European apparel manufacturer that underwent a three-year process of re-drawing its boundaries, we found that the existing theoretical frameworks could neither fully explain the nature of this firms’ boundary changes, nor could they explain the intended and realized benefits thereof. Our inductive, longitudinal evidence suggests that over and above making individual “make, buy or ally” choices, firms such as ours also deploy particular vertical architectures. We illustrate the concept of vertical architectures, i.e. the logic that binds together different transactional choices, the value chain segments a firm decides to be active in, and the configuration of activities along the chain. Firms such as ours, we argue, can change the permeability of their vertical architecture, i.e. the extent to which they subject themselves to intermediate markets along the value chain, without changing their scope. Permeable vertical architectures such as the ones adopted by our apparel manufacturer (partly integrated, and partly open to the market) are adopted because of the expected dynamic benefits they bring about. First, vertical permeability enables better utilization of resources and capacities, and better matching of capabilities to market needs; also, through the resulting provision of market-based benchmarking, firms can enhance the operational efficiency of particular units. Second, through increased transparency, permeable architectures provide a blueprint for allocating resources and facilitate an effective growth process. Third, partial integration helps foster the development of strategic capabilities by providing links between key parts of the value chain. Our involvement in the field suggests that while re-designing the vertical architecture entails substantial and costly changes in processes and organizational structure, it can also enhance a firms’ competitive prospects. Our granular case analysis also suggests that the study of a firms’ vertical architecture can help us better understand the firm and its dynamic capabilities. It can also help avoid potentially confusing or misguided discussion of “hybrids”, re-focusing research from the individual transaction to the multiple boundaries of the firm.

**Keywords:** Firm Boundaries, Vertical Architecture, Vertical Dis-Aggregation, Modularization, Capability, Vertical Permeability
1 INTRODUCTION

How do firms set their boundaries, and what determines the vertical structure of a firm’s value chain? In following a European apparel firms’ three-year effort to re-design its own boundaries, we found it hard to frame the evidence with existing theory. While over the last few years we have witnessed explosive growth in the literature on what drives the individual choices of firms about whether the firm will internalize a potential transaction or whether it will procure the input through the market (Hart and Moore, 1990; Williamson, 1985, 1999), we know much less about how firm boundaries are set and designed. As a result of the micro-analytic focus of Transaction Cost Economics (Coase, 1937; Williamson, 1985), the entire literature has been concerned with the conditions under which a firm might “make” as opposed to “buy”, or, as more recent research has pointed out, when it might want to “ally” (Dyer, 1996; Williamson, 1999). Rather than considering the actual boundaries of real organizations, as they are designed and evolve, the literature has focused on the choice of governance modes of particular transactions, and that made it very hard to use existing theory to explain and account for the impacts of the changes our firm underwent.

Specifically, the problem is that the literature has been so preoccupied with the analysis of “discrete structural alternatives” -- that is, to make, buy, or ally -- that it is common today to juxtapose the firm with the market or “the hybrid” (Foss, 2003; Williamson, 1996). This juxtaposition, however, risks being confusing for two reasons. First, as Coase (1937) had pointed out, every firm connects with the market, both in order to purchase the necessary inputs (in the case of a fully integrated firm, raw inputs and labor) and in order to sell whatever goods or services it produces. The real question, then, is if a firm focuses on particular parts of a services’ value-added chain- if it is active only in a small part of the productive process, buying semi-finished goods or processed services and / or selling to intermediate markets, as the firm we studied did. This suggests that firm’s boundaries should be considered as a whole – not only as a set of independent make-or-buy choices, but rather as the pattern of choices a firm makes. A firm will connect with markets, both final and intermediate; the question becomes, when and how does it do so.

Further, existing research can largely presume that, for each part of the value chain, a firm either makes; or buys; or allies. Even the discussion of “hybrids” (Williamson, 1996) refers to the specific organizational and governance choices firms make in the context of a particular transaction or a set of transactions. The possibility that a firm both makes and buys the same input; as well as the possibility that it both sells an intermediate good and sells a final good is, for existing research, an anomaly; yet this is what we observed, in a significant number of steps of the value-adding process of our firm, as it decided to open up its boundaries. But is making and buying at the same time really an exception, an anomaly? Alas, given the focus of current research on the individual decisions of making or buying, we would not really know, as we do not focus on what a firm does. The little evidence we do have, though, is potentially disconcerting. Harrigan (1985; 1986), in a rare study that has considered the possibility of firms both making and buying (as well as the possibility of both transferring downstream and selling in
intermediate markets) finds that such mixed modes are empirically the most widely used ones, dominating market procurement or full integration. Heide (2003) also recently noted that many organizations employ both in-house and market-based marketing or distribution arms, and Parmigiani (2004) has provided survey evidence attesting to the importance of concurrent sourcing, a theme also discussed by Jacobides and Hitt (2004). More tellingly, empirical studies of vertical integration often use continuous measures of scope, which attest to the importance and prevalence of both making and buying.

These two problems, taken together, suggest a change of focus from the analysis of “make vs. buy vs. ally” to the analysis of the “nature of interfacing with markets, intermediate or final” and to the analysis of the extent to which firms buy from or sell to intermediate markets along the value chain where they operate. By doing so, we may better understand why firms use particular ways of connecting to intermediate markets, and we might better understand the implications of “opening up” a firms’ boundaries, either partially or wholly.

The need to change our focus from the “make or buy” question to the qualitative nature of a firms’ boundaries was reinforced in the very first steps of our empirical investigation of a major European apparel manufacturer. The company we studied underwent a major re-definition of its boundaries, and we had the opportunity of following and documenting this three-year long process of vertical transformation. Without changing its vertical scope or aggregate degree of integration, the firm we studied drastically changed the degree to which it was “open” or used intermediate markets along the value chain. The decision to partly open the boundaries of the firm to the market, both by selling to and by buying from intermediate markets represented a major change— a change that might have remained undetected if we were to use the traditional measures of scope. The extent of partial opening of the firm to intermediate markets along the industry’s value chain, as a seller and / or buyer of intermediate goods, is what we term *degree of vertical permeability*. Through our inductive, in-depth study of this company that drastically changed its vertical permeability without changing its scope, we consider what are the benefits that this permeable structure can bring about, and we identify nine distinct modes of vertical permeability, most of which we identified in our setting. Our study thus provides an inductive, grounded analysis of the organizational and strategic rationale behind the inside-outside mix, and explains the immediate benefits associated with the change in a firms’ boundaries.

Furthermore, our inductive study suggests considering not only the benefits of permeability itself, but also the overall design logic of a firms’ boundaries. We coin the term *vertical architecture* to jointly denote the choice of the specific parts of the value chain where a firm operates; the related degree of vertical permeability; and the connection between vertically related units. The evidence from the firm we studied points to the existence of a strategic and organizational logic of the vertical architecture that goes well beyond the specifics of the make-or-buy choice. Rather than simply correcting “transactional mis-alignment” and generating the associated efficiency gains, our case-based evidence from the organizational redesign process suggests that the architecture of a firm’s boundaries can create *dynamic benefits* at the corporate level, in three distinct ways. First, vertical architecture and the degree of
Exposure to intermediate markets can foster more effective and efficient operations by regularly benchmarking in-house operations against intermediate markets, and by enabling the firm to improve the match between its capabilities and capacities throughout the value chain. Second, vertical architectures that are “permeable” can help guide resources to the more deserving parts of the organization, and facilitate effective “unbalanced” growth in the value(104,119),(892,818)
and effectively re-invigorated itself as a result of the new vertical architecture it chose. Our process-based research (Mohr, 1982) allows us to examine this process closely, and to provide a new framework that explains how the design of firms’ boundaries can generate competitive advantage. This framework, introduced in the fifth and sixth section of this paper, could be used to improve other organizations.

Before delving into the details of our case-study, though, we first consider the existing theoretical framing. Thus, the next section of the paper includes a review of the literature on what determines the (vertical) boundaries of the firm. We then analyse the setting for our study; we describe the firm, a major European apparel manufacturer, and its context, to establish the co-evolutionary dynamics between the firms’ boundaries and its competitive environment. We then briefly consider the three-year vertical re-organization effort. We look at the nature of the changes to our firm’s boundaries and propose a framework which assesses the reasons for and expected benefits from these changes. We discuss how vertical permeability i.e. the openness of the firm to different intermediate markets along the value chain, and the associated vertical architecture can affect an organization, and suggest that the motivation and impact of the design of firm boundaries go far beyond the micro-analytics of the individual “make-buy-or-ally” choice. We conclude with a discussion on how our findings contextualize and complement existing theory, and identify the avenues for future research on designing firms’ boundaries.

2 Existing Theory

The question of the boundaries of the firm, and in particular of vertical scope, was first raised by Coase (1937), who observed that in deciding how to set their firms’ boundaries, entrepreneurs and managers weighed up the benefits of relying on internal production against the costs and risks of using the market. However, it was not until almost forty years later that the pioneering work of Williamson (1971; 1975) and Klein, Crawford and Alchian (1978), led to what we now know as Transaction-Cost Economics (TCE). TCE theory identified that under certain conditions the costs of using the market would be such that the firm would decide to internalize a transaction through making in-house. The idea of vertical scope was central to TCE (Williamson, 1985), and a firm’s decision in relation to boundaries became synonymous with the decision to integrate a particular transaction within its own governance structure: the decision to make rather than buy. For instance, asset specificity would lead a potential party to a market transaction to become liable to post hoc opportunistic renegotiation. Thus, in order to safeguard valuable yet asset-specific investments, firms had no choice but to integrate, especially if uncertainty exacerbated the risks involved in renegotiation.¹ Therefore, to understand a firm’s boundary decisions it is necessary to understand the determinants of asset-specificity. A huge body of empirical and theoretical research has examined the accuracy of the main thesis of TCE, and it appears that the evidence broadly

¹ Note that, for economists, the “natural state of affairs” is lack of integration, since the market incorporates “strong incentives” (Holmstrom and Roberts, 1998; Williamson, 1985), and market-based arrangements do not suffer from the problems of bureaucracy associated with integration. In other words, being dis-integrated attenuates the agency problem and ensures that the incentives for innovation exist at the local level - independent firms can internalize the benefits of their own work (Eisenhardt, 1989c; Monteverde and Teece, 1982; Richardson, 1996; Teece, 1986).
supports the link between asset-specificity, uncertainty and vertical integration (David and Han, 2004; Shelanski and Klein, 1995).

Various researchers have elaborated on the TCE approach. The 1990s saw considerable debate over the interpretation of TCE findings and the nature of the advantages of internalizing production. Kogut and Zander (1996), for instance, suggested that firms provided more than transactional havens; they provided loci of identification, and the organizational backdrop against which knowledge and experience could be shared and applied. Conner and Prahalad (1996) advanced the theory on why we keep things within the boundaries of one organization: vertical integration (or hierarchical governance), they argued, helps solve informational problems, even in the absence of any transactional risk. Ghoshal and Moran (1996) pointed out that production within firms has some distinct benefits over using the market for reasons of knowledge and coordination, a view that Grant (1996) supported in his discussion of the knowledge-based view of the firm. As Foss (1996) suggested, this line of the literature is comparatively weak in identifying what drives firms to internalize particular types of activities, and does not explicitly consider how the firm sets its boundaries, or how the boundaries might shift over time. Nevertheless, these developments do suggest that integrating not only saves on transaction costs (helps “avoid the negatives”) but also helps create value through better information flow, coordination, and concerted problem solving (Arrow, 1974; Nickerson and Zenger, 2001; Pelikan, 1969).

Over the last decade attention has shifted towards examining how the capabilities and idiosyncratic aspects of firms might affect their boundaries. Drawing on Richardson (1972), researchers have recognized that firms might be “islands of cooperation”, and that the decision about whether to integrate or not may be related to the firm’s capabilities. Argyres (1996) found that the decision about whether to make or buy was based on both capabilities and transaction costs, a finding replicated in large-scale studies by Combs and Ketchen (1999), Schilling and Steensma (2001), Leiblein and Miller (2003), and Jacobides and Hitt (2004). These studies suggest that in setting their boundaries, firms have to take account of their own particular conditions and circumstances (Madhok, 2002; Williamson, 1999). As Jacobides and Hitt (2004) note, a firm’s decision to integrate or not may be related to its capability to transact, i.e. the relative efficiency in working with outside partners, a theme developed by Argyres and Liebeskind (1999), Mayer and Argyres (2004), or to its productive capability, i.e. the efficiency of the firm in a particular part of the value chain (see Jacobides and Winter, 2005; Walker and Weber, 1984). The importance of productive capabilities, both static and dynamic, in determining integration has been thoroughly explored by Teece (1986), who examined how capability (in his case, innovation ideas) combined with contractual difficulties (in terms of intellectual property protection) to shape firms’ predicted or prescriptive scope (cf. Chesbrough and Teece, 1996).²

² A small, but growing strand of literature has recently begun to study how the structure of the value chain evolves (Christensen et al., 2002; Jacobides, 2005; Jacobides and Winter, 2005; Langlois, 2003). This strand of literature has highlighted the need to look at the dynamics that shape the “transactional choice menus” firms face, and suggested that often firms do not have the opportunity to choose integration over market-based procurement, as there is no intermediate market for the particular goods or services.
While these two strands of literature have both enriched our understanding of the benefits of integrating and provided an additional, capability-based rationale for why integration happens, a third set of arguments has proposed that in addition to “making” or “buying”, firms have the option to forge alliances or participate in networks to supply inputs or outputs (Dyer, 1996; Powell, 1990). TCE theory incorporated these ideas, terming them “hybrids” (Williamson, 1991), or the “swollen middle” in the continuum between markets and hierarchies (Hennart, 1993). The debate over whether they are “hybrids” or whether they are distinct and have their own rules and logic (Powell, 1990), still rages. Network studies (Sorenson, 2002; Stuart and Podolny, 1996) suggest that such arrangements have no discrete logic. However, by the end of the 1990s it had become clear that, in addition to “buying” or “making”, a firm could also “ally” (Gulati et al., 2005).

Finally, sociological research has looked at the relative role of firms and markets as coordinating devices, and has challenged the presumption of institutional economists that markets use prices as their basic coordination device, while firms use fiat and authority (see Arrow, 1974; Hayek, 1945; Milgrom and Roberts, 1992: ch 3; Williamson, 1985). Granovetter (1985), for instance, in a seminal paper argued that markets have several social control mechanisms that mitigate transaction costs, an argument amplified by social analyses of markets (e.g. Abolafia, 1996; Fligstein, 2001). Succinctly put, the argument was that “markets exhibit traits of hierarchies, and hierarchies exhibit traits of markets” (Bradach and Eccles, 1989: 101). Eccles and White (1988) maintained that even within integrated firms, transaction costs persist, and that often internal customers could be transactually more troublesome than outside buyers. Stichcombe (1990) and Bardach and Eccles (1989) suggested that within both firms and markets, prices, authority and trust all operate, albeit in different proportions and combinations. As such, the theoretically sharp distinctions between firm and market arrangements did not correspond to the empirical reality - a theme more recently been investigated by Zenger and Hesterly (1997), Foss (2003) and Bidwell (2004).

All four sets of literature, however, maintain that for any given set of attributes (in terms of transactional risks and the related levels of asset-specificity and uncertainty; in terms of the potential informational problems and asymmetries when relying on the market; in terms of capabilities in contracting, allying, or producing; and in terms of social embeddedness and the prevailing norms of exchange), firms will either make, buy, or ally. Researchers may differ in their assessments of what ultimately motivates this choice and what it means, or of how these discrete structural alternatives compare in terms, e.g., of their effectiveness, their use of authority or price as information signals. However, they are fairly unanimous that one of these modes will be appropriate under specific conditions.

These views may be out of line with the empirical reality. In the only comparative study that surveys a large set of industries and considers the actual governance choices made, Harrigan (1985; 1986) finds that the majority of sectors, regardless of how industries are classified, make use of tapered vertical integration-- that is, they use both the market and the firm to the same ends. This is not, therefore, a hybrid; it is a plural mode. Bradach and Eccles do note the use of “distinct organizational control mechanisms operating simultaneously for the same function by the same firm” (Bradach and Eccles,
Also, much empirical research on TCE that examines integration converts a continuous measure of integration into a binary measure-- and this in itself is evidence of the prevalence of mixed modes (see David and Han, 2004; Shelanski and Klein, 1995 for a review), an issue noted by Parmigiani (2004), who studied concurrent sourcing through a survey of industrial purchasing. Heide (2003) also provides evidence of dual mode in industrial purchasing, and provides an agency explanation, in that this dual mode facilitates monitoring of outside suppliers. So while concurrent use of the market and the firm may be important, it has not been studied in the existing literature, and, more important, it is still considered a theoretical “oddity”, despite its potential empirical prominence. No theory has been developed to directly address this issue and, more alarmingly, almost no empirical evidence about the extent of concurrent use has been gathered. The existing theory generally does not address this issue and so the relevant questions do not get asked.

One exception is Bardach (1997) who provided a study of the concurrent use of owned and franchised units in chain organizations. This does not answer our main question, i.e. whether and how the firm uses intermediate markets along the value chain. It concerns a related, yet analytically distinct case, showing that an organization can profit either from conducting the operations itself, or through the use of franchising arrangements.3 The focus in our study is similar. We try to explain the variety of choices involved in the decision to make or buy, much as Bradach examines the choices involved in deciding whether to own or franchise. We study the organization and its dynamics, as they are affected by the decision to make or buy, much as Bradach provides an organizational rationale for the decision of firms to go for a mix of owned and franchised stores.

Finally, it should be noted that organizational theorists have largely overlooked the question of how firms actually set their boundaries. With the exception of Nadler and Tushman (1988), who briefly mention enterprise design (an element of organizational design that also includes the question of whether a firm should be integrated or open to intermediate markets in different sectors of their value chain), there has been very little research into the “vertical structure of production”-- that is, the question of how the firm divides labour between different units or between different firms-- and how or why this might change. The literature on organizational design, while highlighting a rich set of phenomena (Baum, 2002; Starbuck and Nystrom, 1981), has not looked explicitly at these vertical dynamics.4 Contemporary

3 While, at some level, this is also a “make vs buy” case, in the sense that a firm can make money either by integrating or by using a market-based arrangement, it looks at a different issue. It considers how a firm can best leverage its potential superiority within a given scope either by organic growth or licensing. Simply put, we are not interested in whether McDonald’s uses its own managers, assets and employees or if it franchises the store operation, or if it does both; but we are interested in the question of McDonald’s overall boundaries, i.e. whether it makes its own installations, if it is involved in food processing, infrastructure, clothing, etc. Franchising also raises some exciting, but fairly idiosyncratic issues, which focus around the balance of replication of and innovation in the identical template (Baden-Fuller and Winter, 2004; Bradach, 1997; Szulanski and Winter, 2002), within a set of already prescribed vertical scope.

4 Tellingly, even the terminology of organizational design differs from that of institutional economists. “Changes in vertical structure” in the traditional organizational design literature, relates to levels of reporting rather than to changes along stages of the value chain. It appears that each literature focuses on one issue, and the clear division of labour has impeded serious cross-fertilization. This may also be due to the fact that there has been little
organizational theorists such as Ethiraj and Levinthal (2004), or Rivkin and Siggelkow (2003), who examined how firms group different activities together, and how these groupings evolve, do not directly consider the question of inter- or intra-firm boundaries.

To summarize, then, we would argue that while research to date has focused on the reasons why a firm wants to buy or make, the boundaries of the firm have received little attention. If this statement sounds somewhat provocative to those who have studied vertical scope, it is intentionally so. We want to underline the fact that to date research has examined whether and when a firm would make rather than buy. Research has looked at the action— the action of making or buying, or allying, and when to go for it but has tended to ignore the actual firm boundaries and how they affect the value chain. To use a “grammatical metaphor”, research has focused on the verb, on “make”, “buy” or “ally”, as opposed to the “noun”, the “boundaries” of a firm. To understand the logic of the “noun”, we are likely to need to do more than add the individual make-or-buy-or-ally choices. An explicit analysis of the overall boundaries of the firm, and of the ways in which it connects with intermediate markets can also help us understand why we see such a common occurrence of the plural mode of both making and buying, and also it may point out other factors which affect the design of a firms’ boundaries.

So, rather than reject data as “anomalies”, as “strange” forms (Menard, 1996) that do not sit well with the theory, we suggest a bolder approach which reconsiders the theory and mode of analysis and shifts the focus to the analysis of boundaries themselves, and to the degree of their vertical permeability. This implies that a new terminology will be needed to describe these new levels of analysis. For this reason, we undertake inductive research to allow us to revisit or complement our canonical representation (that is, our focus on the individual decision to make or buy, as opposed to the overall boundaries of actual organization) and focus on some interesting and as yet understudied dynamics that transcend (without refuting) the micro-analytic details of individual transactions. This will complement the recent discussions of path-dependency in transactional choices (Argyres and Liebeskind, 1999; Mayer and Argyres, 2004), by looking at dynamics at the firm level, as opposed to the transaction dyad or transaction group level (Shanley and Peteraf, 2004). Furthermore, focus on the boundaries of the firm potentially steers the analysis away from discussions of hybrids and should enable a more balanced and empirically grounded understanding of the choices in relation to firm boundaries.

As Bradach and Eccles (1989: 116) note, “the analytic focus must be moved away from exclusive attention to individual transactions; instead, the dynamics of whole structures must be examined since the transactional context affects the control that can be brought to bear on individual transactions”. We phenomenon-driven empirical work, which would have highlighted the less-studied connections between the traditional organizational design literature and the analysis of vertical scope.

5 A potential source of confusion in the literature may also be due to interchanging the “verb” and the “noun” in inconsistent ways. The “boundary of the firm” has become synonymous with the “make or buy or ally” choice, so that discussions of the boundaries an individual firm have confusingly been used as synonymous with “making vs. buying”. Yet all firms that make, also buy some inputs. The “noun” itself, i.e. the boundary of a firm, should not be confused with the “verb”, the choice a firm makes. We believe that some (but clearly not most) of the confusing discussions of “hybrids” may be due to this potential semantic incongruence.
concur with this view and suggest that as students of organization design, it is necessary to understand the boundaries of the firm more deeply. Understanding the degree to which firms are open (or not) towards intermediate markets will also contribute to the recent discussions about organizational modularity, as the extent to which a firm opens itself up to intermediate markets can also lead to modularity along the value chain, i.e. to the creation of separate modules, or steps along the production process. Finally, by looking at a firm that re-designed its boundaries we may be able to better understand why a firm adopted a (new) vertical architecture, and how it expected to benefit from it. We do so using very rich data from a major European apparel manufacturer that recently re-designed its boundaries. Through our inductive analysis, we develop and illustrate the concepts of "vertical permeability" and "vertical architecture" to explain the logic behind the design of a firm’s boundaries.

3 METHODS, DATA, CONTEXT AND SETTING

Methods

This research is based on a single-case study of a major European apparel manufacturer that designs and manufactures clothes for men, women and children. The company was vertically integrated and sells the major part of its production to independent retailers or department stores. We refer to the company by the pseudonym Fashion Inc. In 2002, Fashion Inc. generated approximately €250 million in revenue and employed almost 4,000 people in Europe. One of the authors conducted a study based on a qualitative research methodology (Eisenhardt, 1989; Voss et al., 2002; Yin, 1994), involving inductive inquiry and field study over 32 months. This allowed direct observation of key parts of the corporation’s main redesign process. This setting was chosen on conceptual grounds rather than for its representativeness (Miles and Huberman, 1994: 27), so we focused on a specific, large-scale vertical re-design effort. The aim was to select a setting that would provide a fertile ground to understand and study firm boundaries, and as such we chose a company that was actively considering the re-design of its boundaries.

This study is based on multiple sources of evidence: archival data, industry publications and manuals, company documentation, and, most importantly, participation in internal workshops, and interviews with employees, ranging from production workers to the Chief Executive Officer (CEO), Chief Operating

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6 Building on Simon’s (1996) and Alexander’s (1964), and Baldwin and Clark’s (2000) pioneering work, management researchers such as Sanchez and Mahoney (1996), Sanchez (2004), Schilling (2000), Galunic and Eisenhardt (2001) and Martin and Eisenhardt (2003) considered how the emergence of connected but discrete (modular) entities within a corporation can lead to the creation of competitive advantage. Recently, the modularity literature has acknowledged that modularity may be more complex in practice than in theory. Brusoni, Prencipe and Pavitt (2001) and Brusoni and Prencipe (2001), for instance, suggest that product modularity does not necessarily lead to organizational modularity, and that knowledge modularity does not follow from organizational modularity. While some recent research has examined how modularization of processes leads to changes in the boundaries of an industry (Jacobides, 2005; Jacobides and Winter, 2005), and that the modularity of products affects the governance choice (Hoetker, 2005; Sanchez, 2004; Sanchez and Mahoney, 1996), little has been done to examine how firms change their boundaries, and whether and how they shift towards more modular vertical forms. As such, there is no literature on which we can directly build, but we hope that our findings will contribute to the burgeoning debate on the nature, causes and consequences of modularity, focusing on modularity in the value chain of a specific firm.

7 We use the term "production process" in way economists use it. "Production" refers to any value-adding step in the value chain (e.g. R&D, designing, manufacturing, sourcing, planning, etc.), and not just to manufacturing.
Officer (COO) and Chief Financial Officer (CFO). We participated in a total of 146 workshops and interviewed more than 130 employees. In keeping with inductive case-based research (Pettigrew, 1990), while we did have some theoretical constructs in mind, we did not impose them. We looked at how the detailed evidence we obtained might inform existing theory, the nature of our constructs. Our interest was to understand (a) the nature of the boundaries of the firm; (b) the way in which people in Fashion Inc. thought about the problem of designing their boundaries (i.e. how they chose what to make, what to buy, what to transfer downstream, what to sell, or how to ally for any of the above); and (c) the rationale for how firm boundaries are set. Our key question was: what the firm does itself, and what it does not, and why. We were prepared to be instructed about both constructs and theory through our data.

Data gathering (or, more accurately, participatory observation) and theory generation followed a cyclical process. As we came to identify constructs and create a theoretical framework, we reconsidered the data and clarified particular issues, all of which led to further theory development. This was thus an iterative process (Eisenhardt, 1989; Yin, 1994). As our theory and conceptualizations developed, we shared them with industry participants, and other researchers who had studied the company in terms of its operational structure. We also made triangulations between different types of data.

Data

The involvement of the research team started in May, 2002 when the company recognized that its vertical structure was problematic, and was considering changes. The company contacted the research institute of one of the authors to ask for some academic input in the analysis and resolution of its design problems, from an operational as opposed to a strategic or organizational angle. The resulting study proceeded in three phases from May 2002 to December 2004. During that time, we were able to review internal documents, including the business plans of the units; operational information on the structure and processes of different units; employee surveys; and other relevant documentation. We also had the opportunity to participate in the reengineering team's twice-monthly milestone workshops, which involved senior management and were held to discuss the changes to Fashion Inc.'s boundaries. Table 1 summarizes the sources of evidence used in the study, and provides a guide to the use of the different sources of evidence throughout each of the three phases. Of particular relevance was our participation in the 146 internal workshops that were initiated by top management with the objective of formulating and implementing the firm's strategic repositioning and boundary changing. We were fortunate enough to participate in almost all of the meetings that related very specifically to the changes in this firm's boundaries. Thus, we were exposed to an unusually rich set of data, and were able to participate in real time during the period when the firm's boundaries were being re-designed and implemented.

The workshops, summarized in Table 2, were the key vehicles that Fashion Inc. used to re-think and change its vertical structure. Top management ensured that key employees (specialists from particular departments or experienced employees) were directly involved in these workshops, and that there was a common understanding of problems and solutions among management and employees. During the
transition period, crucial results were discussed with and signed-off by top management on a two weekly basis. This process allowed us to obtain a unique level of inter-subjective agreement about both the nature and drivers of firm boundaries. The content and outcomes of the workshops were transcribed for the company archives—the firm was keen to keep an accurate record of the change process. We were able to access these records to augment our own notes and ensure complete understanding. These records were reviewed by the workshop participants to ensure there were no ambiguities.

In addition, we confirmed quotes or comments and specific findings, with personal notes. Several progress reports were produced by the researchers, summarising the current status. These reports were reviewed by the company and guaranteed a common mindset in relation to the different stages of the corporation's change process, and the authors’ research. During this process, any discrepancies in what had been reported were discussed with the employees concerned and the documentation revised accordingly. This intensive involvement of company participants and the existence of multiple sources of records ensured data accuracy.

The research proceeded in three phases, as summarized in Table 1. During the first phase, from June 2002 to January 2003, we undertook an in-depth study of the industry, and also analyzed firm-level documentation, archives, structures, etc, and conducted the first round of 116 interviews with employees and management in order to completely familiarise ourselves with the problems Fashion Inc was facing. Weekly meetings with the reengineering team were maintained throughout the study, and meetings with senior management were held twice monthly. In addition we participated in 8 workshops involving 205 employees, which were aimed at identifying the problems within the corporation that were the result of its previous (integrated) vertical structure. In the latter part of this phase, between October 2002 and mid-January 2003, we attended 14 strategy workshops involving 75 employees, which were aimed at ensuring that the newly developed strategy and associated vertical structure could be properly implemented. By the end of this stage, we had a picture of the previous and the proposed boundaries of Fashion Inc, as well as a list of all the problems caused by the nature of the existing boundaries, and the solutions that a vertical re-organization might offer.

The second phase of the research took place between February 2003 and February 2004. We attended sixty-five workshops involving 43 employees, during which Fashion Inc finalised the process redesign of its new vertical structure. We reviewed the documentation on the related Information Technology (IT) infrastructure and the specifications for the new firm layout. By the end of the second phase, we had a list of preliminary findings and frameworks, which we presented to Fashion Inc executives.

The third phase of the project took place between mid-February and December 2004. During this phase, we both confirmed and fine-tuned our theoretical perspective and collected the necessary data to support our theory. We maintained weekly contact with Fashion Inc in order to follow the implementation of change to its vertical structure. In addition, we held semi-structured discussions with the internal reengineering team and with top and middle management about the detailed changes. We conducted a
final round of 14 interviews with employees throughout the organization, including the owner, the CEO, the CFO, members of middle management, department specialists, and with some former employees, in order to finalize, share and confirm our findings, as summarized in Table 3. The meetings lasted between 75 and 180 minutes. We took notes in these meetings as recording was considered to be too intrusive.

**Context: The Apparel Industry and Evolution of the Value Chain**

The value chain falls into four distinct parts depicted in Figure 1: Fiber & Fabric, CMT (Cut, Make & Trim), OBM (Original Brand-Name Manufacturing) and Retail; see Gereffi (1999) for a discussion of this sector. The first two steps in this value chain (Fiber & Fabric and CMT) constitute traditional apparel manufacturing from fiber to the ready-to-sell garment. In the OBM phase, companies establish a brand, and design clothing. This link in the value chain involves identification of attractive sourcing locations, and networks to connect manufacturing and retail (Gereffi, 1999). The last stage in the chain is retail, i.e. the provision of an appropriate selling environment for the final customer.

*Insert Figure 1 about here*

Clothing manufacture has a long history, and is inextricably linked to the growth of capitalism and the modern corporation structure (Gereffi, 1999). Since the early years of the 20th century, the value chain in this very mature industry has been shifting towards dis-integration, and a variety of different organizational and institutional structures has proliferated all of which co-exist. The “traditional” structure in the early part of the 20th century was for firms to have their own brand manufacture, and Fiber & Fabric and CMT co-located in one region. However, increasing availability of cheap labour in developing countries led to a change in this integrated mode of organization, and the most labour-intensive parts of the production process were increasingly relocated to various countries (Gereffi, 1999). This started with CMT, an easy candidate for outsourcing being a distinct step in the value chain. Fiber and fabric was next to be outsourced, leaving specialisation in OBM for developed countries. OBM itself was not protected from the pressure to dis-integrate, and further specialization within that part of the value chain ensued. Some firms focused on design or on marketing, whereas others built competencies in logistics and sales; some firms chose to improve their competencies in all of these value-adding activities while others narrowed their expertise and became vertical specialists (see Figure 2). The trend towards such specialization was reinforced by the success of large firms that pursued only branding and marketing – which fostered the development of a vertically co-specialized eco-system. Firms such as Levi Strauss built on their growing brand appeal, pushing aside the integrated firms that were focusing on cost, reliability or local access. The dominant trend in the industry, therefore, was to leave manufacturing to low-cost countries, and to focus on particular niches in the value chain.

*Insert Figure 2 about here*

While most firms opted for a dis-integrated model, focusing on their areas of competency, vertical integration was still successfully pursued by a few companies, such as ZARA and Benetton (Camuffo et al., 2001; Ferdows et al., 2004; Ghemawat and Nueno, 2003). These firms are still involved in
manufacturing (Fabric and CMT as well as Retail) and derive competitive advantage from being flexible and fast while maintaining high quality – which allows them to continue to be integrated in high-cost areas such as Western Europe. This particularly applies to high-fashion apparel that requires rapid response, since integration, especially in the fashion industry, facilitates speed and responsiveness (Richardson, 1996). Also, using end-to-end solutions, including being integrated into retail, increases the knowledge about customer behaviour that makes innovation in terms of design and manufacturing more effective. This is the core strategy of firms such as ZARA (Ghemawat and Nueno, 2003) and is the background against which Fashion Inc. had to design and redesign its boundaries.

Setting: Fashion Inc.

Fashion Inc. is a long-established apparel manufacturer with a well-established own brand. It was involved in all stages of the value chain except the production of fiber, which was sourced externally: it had its own fabric and CMT facilities, mostly in Eastern Europe, and its own OBM activities located at its Western European headquarters. However, involvement in direct retail to end customers occurred in only a few outlet stores and did not significantly contribute to the firm’s revenue: Fashion Inc. relied on sales to independent retailers and major department stores. This reliance on a type of distributor whose prominence was declining, along with rather weak own OBM and branding, led to Fashion Inc. suffering a severe crisis in the late 1990s. It was in the position of being unable to sell effectively (as the relative position of its retailers was dwindling) and even if it found shelf space to distribute its products, it faced pressure from other branded products. In other words, downstream weaknesses in sales, marketing and distribution were leading to financial losses, and even to potential bankruptcy.

Competitive pressures put a further strain on the structure of Fashion Inc. and its boundaries. In the early 1990s, it became clear that CMT, being the most labour-intensive part of the value chain, must relocate to a more cost advantageous location if the firm were to remain competitive. Fashion Inc. acquired several CMT production facilities in Eastern Europe and divested itself of its Western European locations. This helped to stave off the crisis for nearly 10 years. As a retired fabric manufacturing unit worker said: “At the beginning, everything was fine and we thought that we would not need to relocate the fabric production”. However, with increasing competition in the retail market, Fashion Inc. realized that fabric production, too, must be relocated. By the end of 2000 (see Table 2), most production activities had been relocated to Eastern Europe. By 2001 it was clear that these geographic relocations were not enough. All mid-priced brands, including Fashion Inc., were under severe pressure (DeutscheBank, 2002). Fashion Inc.’s strategy for the growth of its own brand was not sustainable. As a manager of the marketing department pointed out, “increasing the market share of our own brand would require a major investment in marketing – and it would still be very risky”. This also meant that following the industry’s trend towards emphasizing OBM and reducing the focus on manufacturing was a risk that the corporation did not want to undertake as it did not sit well with its comparative strengths, which were more upstream.
Fashion Inc. therefore analysed its entire value chain. First, it recognized that profit could be derived from all steps in the value chain and that closing down or selling off its manufacturing facilities would jeopardize the fairly stable part of its business and introduce uncertainties and volatility. A top manager from one production facility summarized it thus: “Our business runs very well – why should we get rid of it?” Second, the changing boundaries within OBM could open up new business opportunities in the shape of services to help other apparel manufacturers reposition themselves. Outsourcers require outsourcees. As one of Fashion Inc.’s marketing manager put it: “Many competitors outsource – why shouldn’t we help them?” Fashion Inc. predicted that certain sets of its capabilities could be used by other companies that wanted to break-up their own value chain; thus, Fashion Inc could vertically co-specialize with firms involved increasingly in brand and design only. Hence, Fashion Inc. decided to maintain its vertical scope while at the same time dis-aggregating various steps in its value chain in order to target new external business opportunities. Fashion Inc. did not need to “invent” new intermediate markets (Jacobides, 2005); it could just open itself up to them. Fashion Inc. decided to pursue this approach by systematically addressing these new opportunities. It involved a substantial strategic change and a consequent realignment of the entire firm requiring a re-drawing of the company’s vertical structure. This was achieved with the establishment in June 2003 of three strategic business (SBUs) units:

- **The Fabric Unit** to offer its excess production capacities to outside customers thereby exploiting internal economies of scale while offering small production lots to customers. Its objective was to maintain and gather market and sourcing knowledge on fiber and fabric. Its own production encompassed every manufacturing step that transformed fiber into dyed fabric.

- **The CMT Unit** to offer excess production capacity to external customers. Production includes cutting, making, trimming and logistics of apparel. The CMT Unit was able to capitalize on recent sourcing trends and its knowledge of upcoming apparel manufacturing regions and countries.

- **The Service Unit** to offer its design, sourcing, packaging and logistics capabilities to external customers. It targeted the “outsourcing paradigm” by being a full-service provider for branded marketers. This would broaden the scope of its market positioning, allowing it to address the low and high price segment. The Service Unit would provide its services for the Fashion Inc brand, and maintain the sales force for its own branded products. It would also provide services to other competitors- for instance, design capabilities. Finally, the Service Unit established a subdivision, the Outlet Unit, to handle direct sales of Service Unit products, thus integrating forward into retail

Top management saw the establishment of the three SBUs as a central element in Fashion Inc.’s corporate strategy. The rationale behind this strategic shift was summarized in a comment made by the CEO that: “whenever we have an attractive opportunity along our value chain [whether drawing on our own units and capabilities or on anyone else’s], we need to seize the opportunity and make profit”.

In order to ensure proper implementation of the new strategy, with the new boundaries, Fashion Inc. initiated a substantial change throughout the entire firm. A reengineering team was established to address
internal challenges and to implement the new corporate strategy. This initiative follows classical reengineering methods (Hammer, 2002; Hammer and Champy, 1993; Tanner et al., 1998): The team members, who had previous worked for a various departments in the firm, were occupied full time on this project; the team was managed by the CEO who committed himself to fully supporting the redesign of the firm. During the first stages of this redesign, the team identified and analyzed the existing operational processes (Tanner et al., 1998). As part of this analysis, all day-to-day processes were mapped and reviewed, and a study was made of the employees involved. In total, over 205 employees as well as two researchers (one being one of the authors) participated in this analysis. Employees were asked to rank the problems and potential fields of improvement in order to identify, from their perspective, the most relevant operational areas of the corporation. The results of this analysis indicated that implementation of the new strategy and the need to vertically dis-aggregate would require a complete redesign of the existing processes. Fashion Inc., therefore, launched into the design of new processes with modular interfaces between business units. Another goal of the company was to standardize information between the business units and have modular designs for products and services (cf. Jacobides, 2005). Once the processes were defined, a systematic implementation process was initiated.

The early signals are that the change in Fashion Inc.’s boundaries is paying off. Fashion Inc. is currently financially stable and secure, and this without external intervention and despite worsening conditions in the industry as a whole, which have led to several competitors facing bankruptcy. It does appear that the changes made to the company’s vertical structure has had positive outcomes. The SBUs are able to utilise their resources and capacities to greater advantage. Although more time is needed before this new strategy can be pronounced a success, the early indicators are very promising: some SBUs’ cannot keep up with customer demand because they cannot increase their capacity quickly enough. As the CEO said: “with the old [vertically integrated] strategy, we would not be at the point we are today”.

The case of Fashion Inc. illustrates how a firm can significantly change its internal and external boundaries without necessarily changing its vertical scope – at least as traditionally measured. In the following sections we present evidence for how and why this happens and what it leads to, and introduce two new concepts "vertical permeability" and "vertical architecture" which help to explain this case.

4 Vertical permeability: exposure to markets at each step of the value chain

It is clear that Fashion Inc. did not engage in a simple “make, buy, or ally” choice in relation to any part of its value chain. Fashion Inc. did dis-aggregate vertically, and did “open up” its boundaries. Yet, rather than splitting up into discrete parts, or dropping a part of the production process, Fashion Inc became both a buyer from and a seller to intermediate markets where it had not previously participated. As existing research does not equip us with the tools to characterize this new structure, we proceeded to propose a framework to map this new vertical structure.
Fashion Inc. encompassed remarkable variety in terms of the nature of the different units, and in terms of whether they bought their inputs or made them in-house, or did both. We observed a considerable difference between the units that only transferred their outputs to Fashion Inc’s downstream operations, and those that sold in an intermediate market. Therefore, we constructed a simple matrix that looked at two dimensions: providing output to internal vs external customers, or to a mix of internal and external customers on the one hand; and the use of internal or external suppliers, or a mix of both, on the other. Figure 3 illustrates and the Appendix explains the nature of, each of the nine cells, which correspond to a different mode of vertical permeability. As Figure 3 shows, vertical permeability can be defined as the extent to which a business unit is “open” to and uses an intermediate market on both the input and the output side. In Fashion Inc. alone seven of the possible nine modes of vertical permeability were in operation, and, even though they were not adopted by any of the units of Fashion Inc. the remaining two modes were considered during the re-design process.

Insert Figures 3 and 4 about here

This categorization expands the usual analysis of vertical scope. A “traditional” value chain depiction focuses solely on the question of whether a firm undertakes one or all of the value-adding steps in an industry. However, our analysis suggests that there are other options in addition to making in-house, buying, or forming alliances. For instance, rather than only considering the option of “integration” (using internal suppliers and transferring to internal buyers) and contrasting it with “specialization” (using external suppliers and selling to external buyers), or “outsourcing” (using external suppliers and transferring to internal buyers), some units in the firm were engaging in what we term “outstreaming” (using internal suppliers, and transferring downstream as well as selling to external buyers on the intermediate market), and “brokering” (using both internal and external suppliers; and transferring downstream as well as selling to external buyers). Figure 4 illustrates only some of the other alternatives we observed, which are further expanded upon in the Appendix.

Insert Figure 5 about here

This newly defined construct of vertical permeability provides a different interpretation of Fashion Inc.’s value chain, depicted in Figure 5: Looking at the new arrows at the top of Figure 5 which represent inputs bought from intermediate markets, and at the new arrows at the bottom of Figure 5 which represent sales to intermediate markets, provides a more satisfactory explanation of how the scope of Fashion Inc. evolved vertically. As Figure 5 shows, Fashion Inc maintained its vertical scope, evidenced by the fact that the breadth of vertical integration was unaffected. At the same time, a number of new suppliers and customers entered its value chain. Thus, its vertical permeability changed but did not affect its scope.

The question that naturally arises is why would firms want to increase their vertical permeability: mixed modes (i.e., both making and buying) have largely been viewed with suspicion by academics (Bradach and Eccles, 1989; Menard, 1996; Parmigiani, 2004). First, we wondered whether the extensive permeability was simply a mistaken observation, and that perhaps the real driver of these patterns was
unobserved heterogeneity. From a TCE vantage point, it could be argued that as the firm both makes and buys it is simply the effect of aggregating the two different types of transactions: Those involving co-specialized assets, and those being generic, whereby the firm makes whatever has transactional risks, and buys the rest. This would suggest that if the analysis were undertaken at the product level, then no mixed procurement would be evident. We considered this possibility and investigated whether what appeared to be mixed procurement in Fashion Inc might be merely the result of coarse measurement, which unduly aggregated heterogeneous items made and procured outside. We thus looked at the product category, and rather than consider sourcing, say, for “refined cotton textile”, we went to increasingly more detailed levels, looking at the sourcing (or selling) of “Jersey” and then “single Jersey, 100% cotton, with standard colours”. However, the mixed procurement patterns largely persisted. The results did not vary by product category, or any other procurement categorization that could correlate with transactional attributes.

The paucity of explanation on the basis of the mainstream theory for this particular instance thus led us to consider alternative explanations, and our efforts were first directed to the benefits that might accrue from greater vertical permeability at the level of the unit. Discussions in the field suggest that there were two primary drivers of increased permeability: first, effective utilization of resources and capacities; and second, effective leveraging of heterogeneous capabilities along the value chain.

Starting with resources and capacities, one of the benefits of using external suppliers in addition to internal production is that it counters cycles and swings in downstream demand (Asanuma, 1993; Nishiguchi, 1994). Likewise, in using external customers, a firm can ensure that its upstream production is not subject to uneven downstream demand. This allows organizations to negotiate their relationship with the competitive environment, and to provide additional buffers (Pfeffer, 1978; Thompson, 1967). For example, Fashion Inc. decided to cater for external customers in its Fabric Unit to fully utilise capacity. This enabled it to use the market to smooth demand by aggregating its own downstream requirements with that of potential external buyers thereby allowing it more effective use of facilities, resources and capacity, and enabling it to compensate for declining demand from the weakening downstream unit.8

Another question we tried to answer was why would a firm manufacture a particular input and then sell it into the market, when its downstream unit was buying a similar input from another manufacturer. For instance, why would Fashion Inc. sell its fabric and at the same time buy in substantial quantities of fabric from outside producers, as Figure 5 shows to be the case? That this allowed Fashion Inc. to better match the timing and capacity of orders upstream and downstream is only part of the answer. More fundamentally, this “double trade” allowed Fashion Inc. to match heterogeneous capabilities in the different parts of the value chain. Fashion Inc. had a medium- to upmarket OBM position, which meant that it required mainly high-quality fabric for its collection. It did not have capabilities to competitively

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8 As a demand planner said for the case of sourcing outside a type of fabric usually made in-house: “if we have a cold winter and people buy more warm clothes than we planned in our seasonal forecast, we sometimes do not have enough supply and we need to use outside suppliers”. While this rationale may be theoretically uninspiring, it does tend to drive much of the variance in our setting: When the Fabric Unit cannot fulfil the demand of a successful item (produced either for the internal OBM or an outside OBM), the CMT Unit uses external sources as well.
produce specific lower quality, lower cost fabric- so buying in from low-cost Asian manufacturers was logical (which eventually raised the question of sourcing the this specific garment, not only the fabric, from Asia). At the same time, it could provide high-quality fabric to manufacturers who lacked the capabilities to produce it or who had different strategic priorities. For instance, the Fabric Unit had the capability and the capacity to develop "functional fabric" (i.e. fabric that is mainly used in sportswear, which does not feel wet on the skin when the wearer perspires). The market positioning of Fashion Inc.'s own brand was not allowing full utilization of this capability. As a result, the Fabric Unit successfully offered its R&D capabilities to outside firms.

More generally, if a company has heterogeneous capabilities along its value chain (e.g. is upmarket in terms of distribution and downmarket in production, or vice versa) and if there is substantial product or service differentiation in each part of its chain, vertical permeability (“openness” for inputs and outputs) can be an effective solution. Vertical permeability, then, is driven by the need to compensate for and better match resources, capacities and capabilities, even though transactional factors might influence individual decisions about make or buy, or the extent of the mix between making and buying. This finding is consistent with recent research on the drivers of vertical scope (Argyres, 1996; Hoetker, 2005; Jacobides and Hitt, 2004; Jacobides and Winter, 2005; Leiblein and Miller, 2003; Schilling and Steensma, 2001).

5 FROM INTEGRATION TO PERMEABILITY: WHY AND HOW DOES A FIRM CHANGE ITS SCOPE?

Having provided a new framework to assess the nature of the boundaries of the firm at firm level, as well as the motivation for greater permeability, we now move to the reasoning underlying the boundaries of the firm. To do so, we first look at the motivation for the change process from the old integrated structure, and identification of the dynamics of the change process. We then proceed to a deeper examination of the systemic logic of a vertical architecture. The specific question we address in this section is, how do firms actually re-design their boundaries? What is involved in this process, and what are the expected benefits? As we were fortunate enough to be participant observers when the decision to change to a vertical architecture and increase vertical permeability was made, we were able to witness first-hand the extent of process and organizational design required.

For Fashion Inc, the first step in re-designing the boundaries was to establish the strategic rationale and objectives of opening up the boundaries. By the end of 2001, senior management was clear that a more permeable architecture was needed. To enable the change to the firms’ boundaries, Fashion Inc created the three independent SBU’s described earlier, and developed business plans for each of the newly independent units to allow organizational independence and the shift from a Cost to a Profit & Loss centre with full reporting authority. Then, six months after the first drafts of the SBU-specific business plans were produced, senior management undertook a detailed strategy evaluation that involved identification of the positioning of Fashion Inc. with corresponding (intermediate) markets along the value chain. The evaluation was based around five questions:
• Is a latent or existing market accessible?
• Does the new business opportunity (business unit) reflect the corporation’s overall strategy?
• Does the new business opportunity generate an adequate return on investment (ROI)?
• Does the firm have the abilities and resources to address the specific market or is it able to acquire them within a reasonable timeframe?
• Does the new business opportunity threaten existing business?

Once the strategy audit was completed (January 2003), the next step was to make the changes necessary to accommodate the proposed new boundaries. The importance of this effort was summed up by the CEO in a major announcement as: “during the process redesign, we do not look at the existing organizational structure, but focus on the best way of doing things at the process level.” This change to process started in January 2003 and the first tranche of vertical changes was completed in December 2003.  

To provide a concrete illustration of the type of process redesign that was needed, the example of order processing for “Key Accounts” (i.e. major orders from established customers) is depicted in Figure 7 (left side). Before redesign, key account orders of apparel were processed by the customer service department, which double-checked with product management and production planning to confirm the feasibility of specific orders. If there was no spare capacity, the order was passed to the key account manager who then checked with logistics and the warehouse. If it was ultimately found that the order could not be filled at all, it was the responsibility of the key account manager to get back to the customer. This process involved five different departments and substantial time and capacity costs. It could not be replicated in the various SBUs, because the overall complexity of the accumulated processes would drastically increase and become unmanageable. Another example as for how process re-design was necessary for supporting vertical permeability can be seen through the efforts to provide an intermediate service by outstreaming. Specifically, other companies frequently asked for “unused” manufacturing capacity in order to subcontract capacity for a limited period of time in both the Fabric and the CMT facilities. Before processes were redesigned, though, the procurement of such efforts was very limited, and not systematic. While the use of these intermediate markets would have been profitable, and would have effectively increased both the capacity and the capability of the firm, the processes that would allow Fashion Inc to offer such intermediate services were simply not in place (see Figure 7, right side). Potential inquiries did not follow a standardized process, and did not allow managers to find a way of “interfacing” with the market. Even if there was a procedure that would facilitate the provision of such an intermediate service, the related processes would be highly location- or even manager-specific. Thus, in the absence of an organizational blueprint for a generic “intermediate goods” order process, permeability at intermediate points in the value chain could not be achieved.

After process redesign, shown in Figure 8, procedures were rationalized and enabled the provision of intermediate markets. The new processes allowed standarized procurement, for instance in order processing. A customer service center was instituted in every SBU, which was also offered the option of

9 As expected, fine-tuning is still ongoing and will become a permanent routine in future years.
providing both final, and intermediate goods or services. The decision on using capacity for Fashion Inc or outside clients was devolved to the SBU and department level. The process modularization that enabled de-centralization and permeability built on both generic and SBU-specific processes within the three core SBUs, as Figure 6 shows. It was also supported by the installation of a state-of-the-art IT system, which facilitated interaction between the units of Fashion Inc., and with external firms. As the Chief Information Officer pointed out: “we need IT-supported integrated processes that are well-running, regardless of where they take place and who is doing them”.

The next step in the re-design of the firm’s boundaries was to shift from re-design of processes to re-design of organization. Once the process redesign effort had taken shape, organizational and job redesign followed consisting of new processes, new job descriptions and responsibilities, and oversight by specific managers of different parts of the production process aligned to the new requirements. The effort of reassigning responsibilities, and assigning areas of control, started shortly after the process design phase was initiated in February 2003. The first layout was completed by the end of 2003; fine-tuning is ongoing to accommodate the various iterations and real-time adjustments of the process. Our sequenced description provides a sense of an orderly, well-thought out process, but the reality was somewhat messier, and the goals of re-design became evident only as the process itself evolved.

The final change in the establishment of the new boundaries for Fashion Inc was the creation of a new set of legal entities -- the new “legal modules” for the underlying business activities. In creating these new legal structures, top management had to balance three concerns. First, the legal structure should, if possible, mirror the emerging independent “vertical modules”. Second, when appropriately managed, the potential tax and regulatory benefits through the creation of legal entities for distinct parts of the production process should be substantial. Finally, management had to take account of union requirements; this was especially important given the constraints of the labour laws in Western Europe. While the existence of modularity in legal and governance terms was important, it was certainly not critical and appeared to be an afterthought when compared to issues of process or organizational modularity; also, legal and ownership boundaries did not always sit well with the actual demarcation of business activities observed in practice. In this sense, the economists’ emphasis on governance or ownership (which changed in part during this period) appears to have been overshadowed by organizational issues in the field.

Finally, more important than legal entities and the associated reporting was the creation of a dynamic set of rules that governed the relationships between vertically related units. The establishment of a Profit and Loss (P&L) structure for each SBU (and also within some of the SBU’s, with the creation of P&L responsibilities for particular departments or production facilities) brought to the fore the need to

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Some of the new processes applied to the whole organization and were based on the principle of leveraging capabilities throughout the organization; some of the processes in the newly specialized divisions were bespoke inasmuch as the requirements of different parts of the value chain led to the need for distinct solutions. Discussion of these dynamics is beyond the scope of this paper; see Gulati, Lawrence and Puranam (2005), on the challenge of balancing integration and differentiation in the context of determining the appropriate vertical scope; and Jacobides and Winter (2005) on a capability-based logic of specialization.
explicate transfer prices. While some local differentiation did persist, Fashion Inc implemented a “cost plus” model that would be able (and expected) to compete with external market prices (see Eccles and White, 1988: S40). P&L structures, then, were an important trigger of vertical dis-aggregation.

Thus, the increase in vertical permeability required major changes in the organization and related processes. This vertical dis-aggregation process can be likened to the process of “mitosis” in biology. Mitosis is the process of a gradual genetic separation, whereby new cells are formed, that preserves some of the original elements in the original cell(s) of the genetic material, so that the attributes are identical to the original in some but not in others. Fashion Inc. went through a slow and far from painless organizational separation that enabled different modules to emerge along its value chain, in which some elements of each vertical module were identical, and some were clearly different. Our case evidence strongly suggests that changes to a vertical architecture, far from being straightforward “make or buy” choices, require substantial, often painful organizational redesign. Changing firm boundaries is not costless. Yet, in the case we studied, it did appear to pay off.

6 VERTICAL ARCHITECTURE: THE ORGANIZATIONAL AND STRATEGIC LOGIC OF FIRM BOUNDARIES

Given the substantial effort needed to re-design the boundaries of the firm what were the benefits that could be expected? As our field research progressed, we realized that changes to the boundaries of the firm, and particularly the increased vertical permeability had impacts that went substantially beyond increased capacity and resources or better matching of capabilities. From discussions with senior management it became clear that the boundary changes were seen as important for an entirely different set of reasons. As we gradually came to realise, the extent to which intermediate markets were used to supplement or substitute for integrated production processes in Fashion Inc. was an important element in the strategic organization design, and also facilitated dynamic adjustment of the corporation. Vertical permeability was seen as a monitoring device (Sabel, 1994) and a means to redirect resources to the most promising areas in the corporation (Burgelman, 1991) thereby enabling some parts of the value chain to grow more quickly than others. Finally, the vertical architecture was intricately linked to the type of competitive advantage the firm was aiming at. In other words, it became evident that the way the markets were used and how parts of the value chain were linked, i.e. the vertical architecture, was a critical element in the organization design and strategy of the firm (Nadler and Tushman, 1989). We define “vertical architecture” as (a) the choice of parts of the value chain in which a firm is active, (b) the nature of the links between and the configuration of the different parts of the value chain in terms of their vertical permeability; and (c) the related process of allocation of capital and transfer pricing between vertically related units.

11 Of course, we should not underestimate the fact that the change to a vertical architecture was an opportunity to “unfreeze” the organization (Tsoukas and Chia, 2002; Tushman and Romanelli, 1985), so some of the benefits were simply the result of the ability to shed some outdated and counterproductive practices, and fine-tune operations and reinvigorate the corporate culture (Birkinshaw, 2000; Markides and Geroski, 2004).
Vertical architecture, then, encompasses the way a firm manages its boundaries, in terms of both total scope and permeability. We identified the architecture as a separate construct, in that there was a particular logic that underpinned choices throughout the value chain. In particular, we observed that the logic of vertical architecture brought potential dynamic benefits from intermediate markets acting as a strategic source of information, as a guide for resource allocation at the corporate level, and to support the development of key capabilities for the firm as a whole.\footnote{It was interesting that rather than using in-house production as a weapon against competing suppliers, as discussed by Porter (1980), and Heide (2003), our case showed a limited use of the market as a signalling and disciplining device for in-house production (also, cf. Eccles and White, 1988: S34).}

The objective of senior management was to transform the way Fashion Inc.’s employees worked, cooperated, and took responsibility and initiative within their own divisions. The vertical architecture and increased permeability were seen as a means to change the organization itself. Changes to firm boundaries were designed to affect the realms of production (Demsetz, 1988; Langlois and Foss, 1999). As the CEO said: “if you want the entire system [Fashion Inc., including the SBUs with their processes, to function [without external intervention from the top], you need to start with firm values”. He knew that this goal was very ambitious and “could not be achieved by the mere announcement of corporate values, but only through daily living. It starts during the daily interaction between the SBUs…and is supposed to end with newly defined roles and ways of interaction…not only within internal but also external interaction [with the market].” The motivation for making changes to the vertical architecture thus went deeper than a mere “streamlining” of the production process and a matching of capacities and capabilities. The new vertical architecture was intended to change behaviours, and has been shown so far to have been successful.

This new architecture, then, was designed to provide a three-fold set of dynamic benefits for the organization as a whole. First, it enabled efficient and effective operations through competitive benchmarking and monitoring along the value chain, capitalizing on the benefits of permeable vertical structures described above. Second, it allowed for better resource allocation and more effective steering of the growth process (Lovas and Ghoshal, 2000). It provided greater transparency and accountability and offered a blueprint for identifying where scarce capital could be put to the greatest effect (Burgelman, 1991). Third, a vertical architecture supported strategic fostering of key capabilities; it provided a framework that allowed opportunities to be maximised company-wide, and ensured the firm could maintain and increase the source of its competitive advantage. So, while choices in terms of scope were clearly related to the existing capabilities of the firm and the transactional conditions, the company also employed the vertical architecture to obtain dynamic benefits. The way in which the vertical architecture can generate dynamic benefits, aided by vertical permeability, is summarized in Figure 9, which shows these benefits from the micro- to the macroscopic level, going from left to right.

\textit{Include Figure 9 about here}
The first set of benefits is the ability to help forge effective and efficient operations. First, Effectiveness was supported through the use of vertical permeability, as was described in the section on vertical permeability. By opening itself partially to the market, Fashion Inc. was able to better utilize capacity and resources and it was able to match its upstream capabilities with the complementary downstream capabilities of other, potentially co-specialized firms more effectively. Second, efficiency of in-house production was benchmarked against other non-captive firms. The company used greater permeability to ensure that it could improve its operations. This would appear to be a fairly simple exercise. Prices for finished apparel made by other manufacturers are easy to get: “Just go into the next store and you know them!” said a manager in the marketing department. However, further upstream, transactions become “one-offs”, order details vary, the number of buyers and sellers involved drastically decreases, and reliable information is difficult to obtain. Furthermore, potential non-captive suppliers might be unwilling to provide this information. As a representative of the Comptroller’s Office (who is currently serving as the Chief Financial Officer) put it: “if you ask certain competitors for the price tag of a specific product several times without placing an order, they won’t give you real prices any more, because they realize that you use them just as an external benchmark”. So sourcing departments in the various business units occasionally may do what might appear on the surface to be irrational: they might sometimes contract to a supplier when in-house production might be equally good, if not better, in order to benefit from having accurate prices, which translates into the ability to gauge the performance of (and determine the resource flows to) different parts of the firm.

These findings parallel those of Bradach (1997: 287-291), who finds that the joint use of franchisees and employees allows for a process of “ratcheting”, which dynamically promotes efficiency; the difference was that in our setting, firms did not engage in a “tournament” of owned vs franchised identical “copies” of the same chain units; rather, they relied on the information that can be generated through the market so as to gauge the effectiveness of the unit (Hayek, 1945).

This brings us to another major observation-- that vertical architecture is not only defined in terms of the permeability along different parts of the value chain and the selection of total scope, but also in terms of the way in which vertical units are linked to each other (in other words, the transfer pricing mechanism, explicitly discussed by Eccles and White, 1988) and how managers are incented to interact with each other and with the market. To understand the merits or shortcomings of a vertical architecture, and the wisdom of individual make-or-buy decisions, we have to consider the organizational infrastructure.

In terms of transfer pricing, Fashion Inc. allows units to set their own prices, and sell either directly downstream, or to outside parties. At the same time, though, the bonus of divisional managers is not primarily related to the unit-level SBU, so that transfer pricing and accounting for cost not become a highly contentious issue. To attenuate potential conflicts in transfer pricing, 50% of each manager’s bonus directly reflects individual performance, and 50% is based on overall company performance as opposed to being primarily based on divisional performance. Thus, as a senior manager explained, “we
ensure that nobody is betraying anyone else inside the corporation”\(^{13}\). This suggests that the use of the market for gaining critical benchmarking information did not need to also be associated with equally strong incentives – that is, managers did not fully internalize the relative advantages of their efficiency, when compared with the market. Their “bonus” was that an effective SBU could grow and receive resources, and along with more resources, more power for the executives involved; and that effective managers would receive personal recognition in their evaluation. But these incentives are much weaker than those described by Eccles and White (1988) in their analysis of transfer pricing and of the inter-divisional conflict it can create.\(^{14}\) Thus, the vertical dis-aggregation and the partial use of the market was used by Fashion Inc. as a tool to promote efficiency and effectiveness, capitalize on market-generated information (Hayek, 1945) without truly “mimicking the market” (Foss, 2003).\(^{15}\)

This subtle but theoretically important point suggests that the market can be used to “infuse the firm” with information, without a drastic change in compensation (cf. Foss, 2003; Zenger and Hesterly, 1997). Rather than engaging in “selective intervention” (Williamson, 1985; Zenger and Hesterly, 1997), Fashion Inc. engaged in “selecting information infusion” that was meant to create good performance targets for its divisions, and guide the allocation of effort and resources. Potential exposure to market pressure, of course, was not welcomed by all. Middle managers in previously sheltered segments were inclined to complain, but senior management were adamant about the importance of these new criteria for ensuring accurate information and transparency. While acknowledging the difficulties being encountered by some newly established SBUs, such as the Outlet Unit, the CEO pointed out: “At the end of the day, they need to make money like all the other business units”. The new architecture was designed to change the structure of, the efficiency and the effectiveness of the business units, even if it occasionally caused some (justifiable) concerns at the local level.\(^{16}\)

\(^{13}\) Another aspect of the compensation model is the annually-defined personal goals for individual managers. A carefully designed structure facilitates the management of upstream-downstream conflicts in terms of quality. That is it ensures that the upstream units do not provide defective goods downstream, artificially inflating their figures and capacity utilization. For instance, if a large number of defective products were encountered in the Service Unit, and mistakes could be systematically tracked back to the CMT Unit, managers and employees in the upstream CMT Unit would have their personal targets for the following year defined to address these issues. This way, Fashion Inc guarded itself against the potentially lethal practice of selling the worse quality products in-house, or to manipulating the transfer-price system for the benefit of particular managers.

\(^{14}\) In setting transfer prices, some additional subtleties emerged. For instance, the external comparison principle requires Fashion Inc. to use transfer prices that are comparable with market prices especially when cross-border transfers are involved. In order to ease the process of transfer pricing in the various business units, Fashion Inc. uses a cost plus method, which complies with the national regulations of the various countries where Fashion Inc. has legal entities. So there are some aspects of the vertical architecture, especially in a cross-border context (Grubert and Mutti, 1991), that cannot be fully controlled by the firms’ management, which is why transfer prices and the concomitant profits of SBU’s were not used as the primary incentivising device.

\(^{15}\) Transfer prices are not in the same way across Fashion Inc, and their exact nature can also change over time (as in Eccles and White, 1988: 48). Transfer pricing policies were seen by top managers as a potent corporate controlling device which can support the improvement of dynamic benefits in the vertical architecture, i.e. fostering corporate capabilities and enabling growth. They were seen and were used as a tool for controlling the behaviour of the corporation (Dunbar, 1981).

\(^{16}\) Certainly, the creation of units that allow for a more permeable structure which allows the “market” to be used as a reference is not without its challenges. For instance, sourcing departments’ comparison between internal and
The second type of benefit that the vertical architecture brought was greater transparency which enabled a superior tool for resource allocation and unbalanced growth. Capacity, and the extent to which divisions could fill it, was used as the gauge that guided where resources should be directed: Rather than relying on managerial assessments about which division needed more investment, or which division should be investigated for potential management changes, the divisions’ effectiveness in covering its capacity profitably provided the guide to the company’s evolution. So divisions that were not competitive (either in terms of "selling" within the firm or to competitors) were left to gradually decline while divisions that were efficient, received more funding and greater capital investment. This mechanism for resource allocation was, in turn, intricately related to vertical permeability. Without the option to either buying from outside or selling outside, divisions could be unwittingly penalised by each other’s performance. Yet, with the vertically permeable structure, an upstream unit could sell to another OBM, should the in-house downstream OBM Unit prove less able to compete. Similarly, an upstream unit could not blame poor performance on the weaknesses of downstream units, and vice-versa. Thus, the relative strengths and weaknesses of divisions become more visible and the mechanism of resource allocation or even of managerial evaluation could be more robust.17

The third set of dynamic benefits that a vertical architecture brings concerns the fostering and development of the key capabilities as a function of the scope of the firm (see Eisenhardt and Martin, 2000; Helfat and Eisenhardt, 2004; Martin and Eisenhardt, 2003; Jacobides and Winter, 2005, for a discussion). For example, Fashion Inc. decided that its competencies in fabric-R&D were strategic priorities that needed to be leveraged at the corporate level. However, although fabric R&D is part of the Fabric Unit, it relies heavily on knowledge about trends and needs that can most easily be obtained from the downstream, retail-facing Service Unit. Thus, to improve Fabric R&D competencies, the vertical architecture must include some link between the Fabric Unit’s R&D and the Service Units’s sales. It need not be an exclusive link, but the importance of the downstream knowledge to innovation upstream must be recognised. It might seem that the SBU between fabric (and its R&D) and retail of apparel, namely, the Service Unit, could have been dispensed with. But, as Richardson (1996) rightly emphasizes in relation to the textile sector, integration is needed for rapid response (which is also why firms such as ZARA are so vertically integrated). Thus, some (but not full) integration is needed along the value chain not only between the Service and Fabric unit (to facilitate information flow and calibrate innovative designs), but also in CMT, in order inform design and fabric-based innovation for the part of Fashion Inc’s collection that requires rapid response to customer needs. To increase capabilities at the corporate level, and to

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17 The nature of the issue and concerns about confidentiality do not allow us to judge to what extent this was a primary driver of involuntary management changes.
maintain another corporation-wide capability, i.e. high degree of flexibility and speed along the value chain, some integration into CMT is desirable. Another level at which important corporate capabilities can be developed is quality management. Fashion Inc. uses its vertical scope to define corporate standards for process and product quality with which every SBU has to comply. Fashion Inc ensures quality control, but it also allows for a superior mode of improving quality control over time, using vertically adjacent divisions to foster these improvements. Thus, the structure of the vertical architecture is intricately related not only to the organizational logic of the firm, but also to the firm’s strategic objectives, and to both the development of and the ability to leverage key strategic capabilities at the company level (Chesbrough and Teece, 1996; Teece, 1986).

To summarize, the evidence suggests that a vertical architecture, i.e. the choice of scope, the decision in terms of the vertical permeability and links between the stages in the value chain, and the way this integrates with resource allocation and individual and SBU incentives, go beyond the “make, buy or ally” choice. As Figure 9 illustrates, the choice of an open vertical architecture improves transparency and enables better monitoring and thus leads to greater efficiency and improved corporate culture, as well as enabling more effective operations through vertical permeability. A permeable vertical architecture also affects capital allocation and top management intervention. Finally, it can support the strategic objectives of the firm and be intricately connected to the logic underpinning the firms’ competitive advantage.

Vertical scope and vertical architecture are established in line with the resources, capabilities, and transactional conditions of a firm. Vertical architecture does much more than simply “fit” with the environment: It has the ability to dynamically shape a firms’ relative efficiency and effectiveness in any part of the value chain, its pattern of growth, and its overall success. Figure 9 also has dotted lines to suggest that vertical architecture can feed back to the relative resources and capabilities that a firm has to take into account in determining its scope. Vertical architecture affects the firm as a whole, and has the ability to dynamically shape its future. As such, it should be studied in its own right as an integral part of strategic organizational design (Nadler and Tushman, 1997; Starbuck, 2003).

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18 The quality of fabric, for instance, is vital in every stage of the value chain. The company-wide definition of the quality operational parameters (process- and product-related) was a task that Fashion Inc. had always consolidated and pursued at the headquarters. This also allowed the generation of quality-assurance capabilities that cut across the stages of the value chain, and which also strengthened Fashion Inc.’s market position.

19 Some additional operational aspects also affect how corporate planners design vertical architectures. Occasionally, corporate management would veto choices of individual units to become more permeable, in order to maintain a degree of manageability, since full permeability creates potentially bewildering complexity. An example comes from the “cut” part of the CMT division, which was only allowed to “outstream” (which limits the sourcing to the in-house Fabric Unit), as opposed to engaging in full brokerage (i.e. the extra flexibility to use external sources of fabric in addition to captive ones). The reason for this restriction in terms of permeability was due to problems of excessive complexity when allowing upstream parts of the firm to use their capacity freely. As an executive from the capacity planning division put it, “we need someone to oversee the entire value chain”.
About three years ago, we set off to study an organization that had decided to change its own boundaries, and its existing vertically integrated structure. Yet our involvement in this case of re-design of the boundaries of that organization was hard to translate into the existing theories about firm boundaries. Not only did the motivation of the change of the boundaries of the firm not fit the existing theoretical framework of when firms change their boundaries and why; but also the very nature of the boundaries of Fashion Inc., and the way in which Fashion Inc. changed them was hard to reconcile with existing research rooted in TCE. The theory to date does not consider the actual boundaries of a real-life organization and the logic underpinning them, focusing instead on the analysis of “making” vs. “buying” or “allying” on the margin. However, as we found through our involvement in the field, this analysis “on the margin” could not account for or explain the changes in vertical structure of Fashion Inc. In other words, existing research did not provide the appropriate vocabulary, let alone the identification of the related causal mechanisms to explain the nature and the implications of these changes.

Yet the changes we observed were both far-reaching, and impactful. Fashion Inc., without changing its total scope, dramatically altered the way in which it interfaced with intermediate markets; and this change, long and arduous to achieve, had substantial implications on its effectiveness, its efficiency, and the extent to which it could meet its strategic objectives. The challenge, in terms of management research, was the lack of a framework that would appropriately describe and explain the motivation for this process of organizational re-design. This raises some broader theoretical questions.

Considering the paucity of existing theory in explaining organizational redesign, then, hints at important limitations of existing theory- in particular, it identifies the limits of existing theory in explaining not only organizational re-design, but also organizational structure. We would argue that this limitation is due to the narrow canonical representations that exist in theory to date, and the inability of existing theory to appropriately capture (let alone explain) the key phenomena we are interested in, and as such provide a satisfactory explanation for the nature and causes of re-designing the boundaries of the firm.

To put this in general theoretical terms, one of the most important benefits of research in management, or, indeed in any social science, is to propose some useful canonical representations – that is, to provide abstractions from reality by creating “theory archetypes” that characterize the world, and provide some elementary ways of representing reality. On the basis of these canons and their concomitant representations, theoretical and empirical arguments about causal structures can be developed (March and Lave, 1993; Popper, 1954). Moving closer to the specificities of our case, the study of firm boundaries has been based on one such canon that took shape in the mid-1970s and has been gaining strength ever since. The focus in almost all of the literature on firm boundaries has been on the management of the “discrete structural alternatives” (make, buy, or ally) to internalize, or not. The debate in the field has focused around the reasons why such internalization occurs. Thus, the questions that have been posed are does internalization happen because of transaction costs, based on the fear of post hoc expropriation?
Does it happen because of the need to align ownership with incentives? (Grossman and Hart, 1986; Hart and Moore, 1990; Hart and Tirole, 1990). Does it happen because of the problems of measuring and monitoring in-house? (Barzel, 1981). Does it happen because of the inability to educate potential outside parties about the desired properties of what will be sourced in real time? (Langlois, 1992; Silver, 1984). Does it happen because it makes sense from a comparative advantage view? (Hoetker, 2005; Jacobides and Hitt, 2004; Leiblein and Miller, 2003; Schilling and Steensma, 2001). Does it happen because it allows firms to focus on their areas of strength and thus promotes differentiation? (Argyres, 1996; Gulati et al., 2005; Jacobides, 2005; Jacobides and Winter, 2005). Or does it happen because it facilitates interaction between adjoining parts in a value chain, by fostering knowledge sharing, identity and organizational integration? (Conner and Prahalad, 1996; Foss, 1996; Ghoshal and Moran, 1996; Gulati et al., 2005; Kogut and Zander, 1996).

All these questions intercross on the “make-or-buy” choice; the conditions that induce the single transaction to be internalized (and stay within the boundaries of one organization) or to be enacted through the market or an alliance. While research has made great strides in identifying the choices that exist, it has done so in keeping with established norms. The literature has focused on the question of the “swollen middle” (Hennart, 1993), the “internal hybrids” (Foss, 2003) and these “strange hybrids” (Menard, 1996) that firms adopt. Likewise, the analysis of small networks of suppliers (Dyer, 1996; Nishiguchi, 1994), the use of vertical groups (Peteraf and Shanley, 1997; Shanley and Peteraf, 2004), and of close alliances as an alternative to making in-house or buying (Powell, 1990) have attracted attention.

Yet, ironically, the boundaries of the firm and their systemic patterns, i.e. the logic underlying how individual transactional decisions are intertwined along a value chain, have not been directly addressed to date. Therefore, by changing the subject of analysis, this paper provides some new insights. By looking at how a firm in its entirety chooses and changes its boundaries, it identifies some hitherto under-analyzed, or entirely overlooked aspects of firm boundaries, focusing on the vertical structure of an organization as it is set and is re-designed in real time. By so doing, it uncovers the deep organizational drivers of firm boundaries, as well as the profound impact that changes in firm boundaries can have on the organization.

More fundamentally, this paper suggests an alternative canonical representation that complements the existing literature. On an elementary level, our example of Fashion Inc. challenges the dominant representation (and measurement) of vertical integration vs specialization (e.g. through the use of industry codes). While Fashion Inc. remained active in all segments of the value chain, its vertical structure changed dramatically. The change was the result of increased permeability and of the logic that bound the different parts of the value chain together. We argue, therefore, that traditional measures of integration would overlook much of the important information that characterizes a firms’ vertical structure, and we emphasise the need to complement existing ideas with a new set of constructs, tools, and empirical focus to directly address the question of how firms shape their vertical boundaries, and why this matters.

Specifically, the construct of vertical permeability, and the nine modes of permeability illustrated in Figure 3 help us better understand the nature of Fashion Inc.’s boundaries, and the rationale behind their
choice. There are some good reasons to consider the nature of vertical permeability and the dynamics of plural forms more broadly: Harrigan’s research (1985; 1986), recently complemented by Bradach (1997), Heide (2003), Nygaard (2003), and Parmigiani (2004) suggest that such forms are far from transient, disequilibrium, anomalous entities; rather, they appear to be empirically very important. Either way, we need more in-depth and comparative evidence, and we require data of a different sort, that focus on the overall sourcing patterns and the boundaries of the firm in their totality.

Our research sheds light not only on the “topography”, but also on the rationale of these plural forms. We identify the role of capacity / resource utilization and capability improvement as a reason to open up a firms’ boundaries. Our findings thus support recent arguments in favour of capability-based factors in driving scope (Argyres, 1996; Hoetker, 2005; Jacobides and Hitt, 2004; Leiblein and Miller, 2003). They also lend credence to the suggestion that scope can be managed so as to ensure dynamic efficiencies and affect a firms’ capabilities (Helfat and Eisenhardt, 2004; Helfat and Raubitschek, 2000; Jacobides and Winter, 2005). Of course, our observations about what drives vertical permeability do not provide definitive answers, nor do we assert that our findings will generalize to different settings. However, they provide a starting point, and demonstrate the need for a new mode of analysis.

By focusing on vertical architecture, our research considers the actual boundaries and the nature of the firm (the “noun”), as opposed to being solely interested in the choice between making, buying or allying (the “verb”). This raises a fresh set of issues that provide complementary explanations about when and why firms decide to open up their boundaries, as focuses on the actual configuration and “geography” of rim boundaries, not just the factors that push firms to internalize or procure in the market for individual needs. By identifying the specific types of dynamic benefits associated with a vertical architecture, we propose to shift the emphasis from the traditional comparative static analysis of transaction costs and existing capabilities to dynamic factors. Specifically, we highlight the very substantial ability of vertical architecture to affect the operational effectiveness and efficiency of particular units; to shape the growth and resource allocation process; and to help foster and leverage key capabilities. We also document how choices in terms of vertical permeability and scope intertwine with transfer pricing and organizational incentives to define vertical architecture, which emerges as a key challenge in enterprise design (Nadler and Tushman, 1997: 232). Our analysis, then, provides a substantially different view of scope, which links to recent research on how organizational structure and choice of boundaries can affect competitiveness (Birkinshaw, 2000; Markides and Geroski, 2004).

Our discussion of vertical architecture qualifies the general mistrust that economists have about “hierarchy” or the integrated firm (Williamson, 1985: Ch. 6), which is usually founded on the premise that vertically integrated firms are prone to inefficiencies because of a lack of market exposure. We partly confirm the problems that can arise by not exposing divisions or managers to the pressures of the market; yet partly qualify the critics of integration in suggesting that an appropriate structure of vertical architecture might take care of some of the “traditional” problems of hierarchical governance. Rather than suggesting “plural forms may be a strategy for “managing” markets”, as they manage to reduce
information asymmetries of buyers and sellers by doing in-house production (Heide, 2003: 26), we argue instead that the use of markets is a strategy to manage firms, by reducing the information asymmetry between managers and employees, and by providing independent benchmarks (cf. Dunbar, 1981, on the difficulties of managing and controlling in organizations).

Additionally, we argue that opening up the boundaries of the firm through a permeable architecture does not need to be associated with the stronger incentives that theory considers inevitable when opening up to the market (Foss, 2003; Zenger and Hesterly, 1997). Rather, we argue that a careful design of incentive structures can allow firms to capitalize on most of the informational benefits associated with the use of the market (Hayek, 1945) without necessarily accepting the drawbacks and conflicts it creates, or the appropriation of rents that could accrue to the firm.

Our mode of analysis, then, links organization design to the economics of organization, and suggests that quasi-integrated firms can generate substantial dynamic benefits. Our analysis also contextualizes the claim of Eccles and White (1988: S40), who suggest that whenever managers of a division can either transfer downstream or sell to another firm through the market, the market appears to be an “easier” option with “fewer” transaction costs. While the perceptions of the managers as for the comparison of internal and external sales may vary, the benefits do not accrue to the company only on a “per transaction” basis; rather, they accrue by the dynamic infusion of information and the strategic allocation of corporate resources. This means that rather than evaluating the ease or difficulty of an individual transaction, we should consider the impact of the vertical structure on the behaviour of a corporate system.

In terms of creating an effective vertical system, Fashion Inc. provides an interesting example, and points to solutions that might have a degree of “ambidexterity” (Tushman and O'Reilly, 1997). By focusing on the vertical architecture in various firms, research can contribute to the development of new knowledge; a theory that focuses on the organizational implications of opening up a firm to intermediate markets along the value chain could be not only a valuable addition to the literature, but also a useful tool for practice.

The substantial impact of the change in vertical architecture on the success of Fashion Inc. in terms of its ability to change the way divisions and individuals within them operate, calls for a more thorough understanding of vertical architectures and of the potential for using intermediate markets. The ability of particular vertical architectures, through a judicious use of vertical permeability, to achieve dynamic benefits at the business unit and corporate levels, should be taken seriously. Casual empiricism suggests that several organizations are experimenting with similar models of vertical architecture, and with the institution of “markets” as a means to link different parts of the same organization, or bridge between the organization and its environment. As Starbuck recently noted, “influential management fads, such as reengineering or outsourcing [among others], have originated from managers or consultants, and the most respected organization theorists have ignored them.” (Starbuck, 2003: 442) We argue that focusing on new regularities will better explain both old and new forms of organization; and that difficult as it might
be to break with tradition within the confines of an academic trajectory (Kuhn, 1962), there may be substantial benefits for practice and theory alike in doing so. The analysis of vertical permeability and vertical architecture could provide one more tool to better understand new organizational forms and their logic (Daft and Lewin, 1990; Lewin and Volberda, 1999).

In terms of canon and representation, our analysis has much in common with other recent work on modularity (Baldwin and Clark, 2000; Sanchez, 2004; Schilling, 2000). It complements these studies by providing a grounded, empirical discussion of how a production process can be divided into different parts. Specifically, we provide a grounded view of vertical modularity and suggest that being integrated, in the sense of owning all the subsequent steps of the production process, does not preclude modularization. We also highlight the role of modularizing processes as a precondition for increasing vertical permeability, and provide an empirical context for the “encapsulation” and the generation of vertical modules. More empirical research of this sort will extend recent work on the nature of vertical modules (Baldwin and Clark, 2000), and explain how modularizing and dis-aggregating within the firm compares with the processes of dis-integration at the industry level (Jacobides, 2005). Finally, our findings suggest that it may be empirically risky to speak of firms as “islands of modularity”, as Langlois (2003) does. Firms themselves may have more or less modular structures, and exhibit different types of modularity along the value chain. We hope that this paper will inform the debate on modularity and shift attention to the actual vertical structure of production in firms as they evolve, e.g. by illuminating the connections between inter- and intra-firm modularity.

Our work also extends and provides specific empirical grounding to the claims of Zenger and Hesterly (1997: 219), who suggest that “the growing ease of selective intervention triggers a need to rethink the traditional institutional framework”. We concur, and suggest that to do so we have to understand the nature of the boundaries of organizations, and the processes underlying their development. The paper provides a new terminology, and a new focus that can help supplement the rich literature, by adding an organizational and systemic dimension, that steers clear of potentially confusing discussions of “hybrids” yet at the same time allowing us to track exciting new developments in organizational design.

These theoretical implications aside, this paper has several limitations. First, we focus almost exclusively on firm boundaries in the sense of steps of the value chain internalized by the firm versus undertaking by other parties. Yet several other types of boundaries are relevant and important. Santos and Eisenhardt (2004), for instance, provide an edifying discussion of the boundaries of power, of competence, and of
identity, and how the different sets of boundaries relate, our study focuses more narrowly on the “traditional” conception of firm boundaries in terms of what is internal to the firm and what crosses its boundaries through some form of market-mediated relationship (Baldwin and Clark, 2003). Furthermore, even in the narrow sphere of the boundaries of “ownership”, we skated over some interesting and subtle distinctions. That is, we focused on what a firm does, what it buys and what it sells; but we did not examine the separate issue of asset ownership (Hart, 1995), or the use of franchising as opposed to owned operations as a means to create revenue (Bradach, 1997). Both these aspects provide a different measure of integration. While in our context changes happened primarily in terms of the “traditional” concepts of vertical scope (i.e., in terms of what a firm buys and sells), the issue of asset ownership, of franchising vs owning and how these issues relate to “traditional” conceptions of vertical scope are in need of further research.

A more important limitation is that we cannot establish the tradeoffs between a highly permeable vs. an integrated structure, or vs. a set of entirely independent, co-specialized entities; nor do we consider the trade-offs between the fixed costs of the redesign of a firms’ boundaries against the dynamic benefits that might accrue. More broadly, we do not identify the conditions under which integrated but vertically permeable structures become problematic, or what makes them possible in the first place. Also, the case of Fashion Inc. provides only limited evidence about allying, and how this fits in the vertical architecture of a firm; this is clearly an issue that should be explored in future research.

Furthermore, while in our case vertically permeable structures appear to be optimal, their limitations or the special conditions that allow these forms to come about need further research. We have also provided only sketchy evidence on the role of transfer pricing and intra-organizational incentives, or divisional incentives, as these relate to and interact with the vertical architecture. Going in greater depth, along the lines of Eccles and White’s (1988) seminal study, would clearly be useful, yet far exceed the limits of this paper that focuses on the provision of a holistic view of vertical architecture, rather than an in-depth investigation of any of its constituent parts.

Finally, as in any case-study, we cannot make any general inferences. We chose Fashion Inc. for reasons of appropriateness rather than representativeness (Miles and Huberman, 1994), and as such the extent to which we can use Fashion Inc. as a generalizable example remains unclear, even though this new mode of analysis seems promising. Clearly, much more evidence is needed and future research looks exciting.

These limitations notwithstanding, we see this research as being in line with the recent call to understand the actual mechanics and drivers of modular structures, and the nature and evolution of boundaries within and between firms. As Santos and Eisenhardt note:

[such new] research needs also to be more process oriented, uncovering the causal mechanisms shaping the formation of boundaries …This may allow us to move way from simple environmental contingencies to a more in-depth appreciation of the complex roles of boundaries. [Our] proposed research program invites research methodologies that are different from the traditional regression analysis on cross-sectional data. In particular, multiple case inductive research and simulation methods may be appropriate. Multiple case research is suited to
longitudinal process research (Eisenhardt, 1989) and can reveal the rationale of organizational members as they make decisions about boundaries. Once this research enables some specification of the inter-relationships, simulations methods may be useful to more fully understand process non-linearities and potential outcomes (Davis et al., 2004). In summary, the synergistic and co-evolutionary inter-play among conceptions promises a better understanding of boundaries. This research should be longitudinal and process-oriented. Multiple case studies and simulation methods are particularly appropriate. (Santos and Eisenhardt, 2004: 32)

We fully concur with this, and this paper is an attempt to provide such evidence. During our fieldwork, we observed that making the decision to change the scope of the firm is far from easy: it involves a challenging process and organizational re-alignment procedure, which in part accounts for the substantial inertia of firms in terms of their scope (Sull, 1999). We have identified how and why firms change their architecture, and pointed to avenues for further research. For instance, the analysis of vertical architectures could help complement recent exciting work on how companies can add value by building on modular patches of competency (cf. Galunic and Eisenhardt, 2001) that shift over time to the most appropriate uses (Eisenhardt and Martin, 2000; Helfat and Eisenhardt, 2004; Martin and Eisenhardt, 2003). It helps explain the Penrosian (1959) dynamics of how firms change their scope over time, and complements recent work on how firms change their scope and capabilities (Eisenhardt and Martin, 2000; Helfat and Raubitschek, 2000; Jacobides, 2005; Jacobides and Winter, 2005; Martin and Eisenhardt, 2003), by shifting attention to the firm and the logic behind its boundary structures.

More broadly, our effort started with the examination of the boundaries per se, and focused less on the individual transactional choice, which led us to an understanding of what “drives the boundaries of a firm”-- that is, to move to an understanding of the nature of the different “packages” that exist in the “institutional structure of production” (Coase, 1991; Jacobides and Winter, 2005), and to the logic which binds different parts of these “packages” together. This can help avoid potentially confusing discussion of hybrids, and will allow us to make greater progress by expanding our purview. It also offers a bridge to recent organizational design and strategy research (Ethiraj and Levinthal, 2004; Gulati et al., 2005; Rivkin and Siggelkow, 2003; Siggelkow, 2001), which looks at the nature of different activities and the way in which they should be partitioned in various units. We hope that the concepts of vertical permeability and vertical architecture can help extend the research on “institutional packaging” and the division of labour between and within firms.

**Concluding Remark**

Our analysis of the three year re-design effort of Fashion Inc. helped demonstrate both the need for new theory to explain why firms set and change their boundaries, and the need for a new terminology to describe the boundaries of the firm as they change over time. The opportunity to participate in a real-life organizational re-design helped us identify the limits of existing theory. It also enabled us to propose a framework that provides new insights on the potential benefits from a judicious structure of firms’ boundaries. In building new theory on the basis of our field evidence, we concur with Kay (2000), who recently noted that:
“Just as an architect might view a house in terms of style, form and function, so a burglar is more likely to see it as a pool of assets. In these respects at least, economists are more like burglars than architects since they tend to have more concern for aggregates and opportunity costs (and barriers to entry and exit) and less concern for intrinsic structural and systemic qualities.”

We would agree with this view and suggest that it is impossible to understand firms and their vertical boundaries without appreciating the manifold impacts of their vertical structure on their success and operations. We need to ensure that we do not lose sight of the forest for the trees. To understand the nature and potential value of organizational design, we need to look at the organization as a whole. We need to dig deeper into the organizational and strategic logic of a vertical architecture, and consider the dynamic benefits as we did in this study.

We hope that this paper is a first step towards this broader view and that this research will foster debate and suggest avenues for further research on organizational design and vertical structure. We also hope that this paper will help provide a fresh perspective on the nature, determinants, and potential impacts of the design of firm boundaries, and that our perspective might establish a mode of investigation that can be of use to practitioners in strategy, organizational design and development, and policy.
REFERENCES


Nygård. 2003. Interfirm control of plural formed marketing channels. working paper.


Appendix:

The 3 x 3 Modes of Vertical Permeability, in Principle and in Fashion Inc.

Of the nine theoretically possible “vertical permeability” modes in our 3x3 matrix depicted in Figure 4, seven are currently used in Fashion Inc., one was used in the past and one is currently being discussed in terms of a potential acquisition. This appendix briefly reviews each of the cells depicted in our 3x3 matrix, explaining their attributes and indicating where we found an incidence of each in Fashion Inc.

Vertical Integration is the transfer of goods and services from one division to another within the firm. It happens where the steps in the value chain are very closely linked or require direct processing. After the “Make & Trim” phase (in the CMT Unit) for instance, the manufactured garment requires “Packaging”, before it goes to order processing and leaves the CMT Unit. No market exists between these two steps in the value chain and, thus, there is only an internal customer and supplier before and after this step of the value chain. One unit transfers its output to another, but there is no structured exchange that crosses the firm’s boundaries (Baldwin and Clark 2003)

Outstreaming happens when supply is captive, but customers are both internal and external. The phase of “cut” in the CMT Unit is an example, since it uses only internal sources from the Fabric Unit. This limitation reduces the complexity of the overall capacity planning; its reasoning is explained in section 3.

Tapered Vertical Integration (Harrigan 1985, 1986, Parmigiani, 2004) occurs when internal and external suppliers service internal customers only. In the phase “Make & Trim” of the Service Unit this mode enables Fashion Inc. to work with high capacity utilization in “Make & Trim”. Internal and external sources then accommodate capacity peaks in “Cut” that could not have been addressed without the usage of external supply. Also, this ensures, again, that the cost conditions are fairly similar to what may be achieved through the market.

Upstream Vertical Specialization refers to internal sources with only external customers. Within Fashion Inc., this mode is used by the sales force of Fashion Inc.’s own brand in the Service Unit. The sales people are very closely associated with the own brand and are very familiar with the customer base in retail. The sales force identifies itself with the brand and would be unlikely to be able to transform this identification to another brand. At the same time, they sell to non-Fashion Inc. retailers. Being part of the sales department means that they only interact with the market.

Outsourcing is widely discussed in the literature and describes exploitation of an exclusive external supply. Fashion Inc. was considering this in the 1990s, but decided against it.²¹

²¹ Once a step of the value chain has been outsourced, it is very hard to reverse it. In the case of Fashion Inc., it was therefore clear that this decision was not appropriate, because it would be on the basis of short-term cost advantages and drastically limit the strategic choices.
**Tapered Trading** consists of using internal and external sources, but addressing only external customers. In Fashion Inc., for instance, a subsidiary of the Service Unit does not design anything for Fashion Inc.’s own brand, but provides this service to external customers. It uses internal and external sources and enables the subsidiary to have a profile that is not directly associated with Fashion Inc. The major benefit of this mode is based on the need to differentiate especially “soft” capabilities, such as designing different brands, that are positioned in similar markets.

**Partial Brokering.** This arrangement ensures market orientation in terms of inputs, with all the outputs being internally transferred or sold to the market. Many integrated companies start off with such an upstream unit (if not with outsourcing). In the case of Fashion Inc. this occurs with fiber, which is sourced outside, but is processed both inside and outside. This mode consolidates fiber demand and makes small amounts of fiber attractive to external knitters. The objective is to use internal economies of scale and negotiate reduced prices with external suppliers as well as to keep prices competitive in internal transfers.

**Trading** consists of doing pure “matching”; rather than being involved in several stages of the value chain, a unit (or firm) operates on a very small part of the value chain. This mode mainly consists of negotiating major manufacturing capacities with Asian manufacturers and sell portions of the capacity to private label firms in Europe or the USA. The underlying business model is based on the capability to consolidate private label demand and exploit economies of scale. Some of these firms trade substantial percentages of the market share, which also makes them attractive. Fashion Inc. did consider the acquisition of one of these traders, but decided against it.

**Brokering** is the mode that utilizes all channels upstream and downstream; internal and external suppliers as well as customers. The goal of brokering is to utilize external suppliers whenever beneficial while offering products and services to external customers. Fashion Inc. uses this mode in the “Order Processing” phase, which mainly operates in Fashion Inc.’s centralized logistics centre. It receives garments from internal and external sources and delivers to external customers and the internal outlet stores. This enables a firm that *appears* to be integrated (active both upstream and downstream) to be fully exposed to the market both for inputs and for outputs. It is the fully “tapered” mode of scope (Harrigan 1985, 1986, Parmigiani, 2004) both upstream (supply-facing) and downstream (customer-facing).
Figure 1: The Apparel Value Chain

- **Fiber & Fabric**
  - Production of fiber and fabric
  - Packaging, logistics

- **Cut Make & Trim**
  - Cutting, making and trimming of apparel
  - Packaging, logistics

- **Original Brand Name Manuf.**
  - Design and product development
  - Branding and marketing
  - Packaging, logistics

- **Retail**
  - Marketing at the points of sale
  - Selling of products to the final customer
  - Packaging, logistics

Figure 2: Examples for the various types of vertical specialization
Who is my supplier?

- External
- Internal & External
- Internal

Outsourcing
- Fashion Inc. - non-existent -

Partial Brokering
- Fabric Unit
- Knitting (Fiber Sourcing)

Trading
- Fashion Inc. - potential acquisition -

Vertical Integration
- Tapered Vertical Integration
- CMT Unit
- Make & Trim

Outstreaming
- Internal & External
- CMT Unit
- Cut

Brokering
- Vertical Integration
- Service Unit
- Order Processing

Tapered Trading
- Internal
- Service Unit
- Subsidiary

External

Upstream Vertical Specialization
- Service Unit
- Sales

Whom do I sell to?

- External
- Internal & External
- Internal

Fabric Unit
- Fiber
- Raw Fabric
- Dyeing
- Refined Fabric
- Dying
- Refined Fabric
- Knitting

CMT Unit
- Fiber
- Raw Fabric
- Dyeing
- Refined Fabric
- Cutting
- Make & Trim
- Packging & Processing

Service Unit
- Garment
- Apparel Design
- Apparel Collection
- Product Development
- Sourcing & Order Processing
- Sales
- Outlet Unit

Arrows: Firm buying (what it could have transferred downstream)

Arrows: Firm selling (which could have been made in-house)
Figure 5: Designing the boundaries of the firm: Firms do more than just make or buy

- Traditional depictions of firm boundaries
  - Integrated value chain
  - Outsourcing a Value-added component
- Additional depictions of firm boundaries
  - Outstreaming a Value-added component
  - Brokering with full vertical permeability: Outstreaming, outsourcing, in-housing

Figure 6: Fashion Inc.'s overall process framework

<table>
<thead>
<tr>
<th>Fabric</th>
<th>CMT</th>
<th>OBM</th>
<th>Retail</th>
</tr>
</thead>
<tbody>
<tr>
<td>Corporate Capacity Planning</td>
<td></td>
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<tr>
<td>Customer Relationship Mgmt</td>
<td>Customer Relationship Mgmt</td>
<td>Customer Relationship Mgmt</td>
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<tr>
<td>Product Development</td>
<td>Product Development</td>
<td>Product Development</td>
<td></td>
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<tr>
<td>Order Processing</td>
<td></td>
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<tr>
<td>Material-flow</td>
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<td></td>
<td></td>
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<tr>
<td>CMT Production</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fabric Production</td>
<td>Sourcing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Order Processing</td>
<td>Sourcing</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Material-flow</td>
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</tbody>
</table>

Legend:
- Generic processes
- Service Unit – specific processes
- Fabric Unit – specific processes
- CMT Unit – specific processes
Figure 7: Example for the order management process before redesign. Left hand-side process: regular apparel customers; Right hand-side process: customers asking for manufacturing capacities

The old process does not contain necessary information

Key account managers and customer service double-check; they also use different double-check loops

Customer

Check in the IT system: Is the order possible?

Yes

No

Negotiations with customer; identification of potential standard articles

Key Account Manager

Internal coordination; placement of an order

Customer Service

Order placement in the IT system

Double check loops are unnecessary

Figure 8: The generic order management process after process redesign; now applied in all SBUs
Figure 9: The Overall Framework: Vertical Architecture and its impact on Organizations

- **Capabilities, resources, and transaction costs**

**Choice of Vertical Architecture**
- Overall Firm Scope, Nature of Vertical Permeability, links between vertically related Divisions

- **Operations’ Efficiency and Effectiveness**
  - Efficiency affected by better benchmarking, monitoring and incentives as $f(\text{vertical permeability})$

- **Growth and Resource Allocation Dynamics**
  - Facilitated by Transparency, $f(\text{capacity use})$, given vertical permeability
  - Effectiveness affected by leveraging capacity / resources matching heterog. capabilities $f(\text{vertical permeability})$

- **Strategic Capability**
  - Fostering through partial integration

**Micro-level Benefits**
- Efficiency affected by better benchmarking, monitoring and incentives as $f(\text{vertical permeability})$
- Effectiveness affected by leveraging capacity / resources matching heterog. capabilities $f(\text{vertical permeability})$

**Macro-level Benefits**
Table 1: Sources of Evidence throughout the Project

<table>
<thead>
<tr>
<th></th>
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<th></th>
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</thead>
<tbody>
<tr>
<td><strong>Primary Sources of Data</strong></td>
<td>Workshop participation, workshop documentation (i.e. handouts, workshop transcripts, working documents, process maps)</td>
<td>Workshop participation, workshop documentation (i.e. handouts, workshop transcripts, working documents, process maps)</td>
<td>Workshop participation, workshop documentation (i.e. handouts, workshop transcripts, working documents, process maps)</td>
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<tr>
<td>· Project management documentation</td>
<td>Personal research notes</td>
<td>Project management documentation</td>
<td>Internal documents</td>
</tr>
<tr>
<td>· Personal research notes</td>
<td>Internal documents</td>
<td>Internal documents</td>
<td>Personal research notes</td>
</tr>
<tr>
<td>· SBU business plans</td>
<td>Ongoing discussions with project management team, as described in Table 3; initial discussion and framing</td>
<td>Personal research notes</td>
<td>Ongoing discussions with project management team, as described in Table 3</td>
</tr>
<tr>
<td>· Ongoing discussions with project management team, as described in Table 3; initial discussion and framing</td>
<td></td>
<td></td>
<td>Semi-structured interviews to confirm theory-building, described in Table 3</td>
</tr>
<tr>
<td><strong>Secondary Sources of Data</strong></td>
<td>Historical studies of Fashion Inc.</td>
<td>Sector descriptions</td>
<td>Sector descriptions</td>
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<tr>
<td>· Sector descriptions</td>
<td>Sector descriptions</td>
<td>Press releases</td>
<td>Press releases</td>
</tr>
<tr>
<td>· Research papers with apparel focus</td>
<td>Research papers with apparel focus</td>
<td>IT-manuals</td>
<td>IT-manuals</td>
</tr>
<tr>
<td>· Analyst reports</td>
<td>Analyst reports</td>
<td>Company manuals</td>
<td>Company manuals</td>
</tr>
<tr>
<td><strong>Company Events involved in</strong></td>
<td>Workshops as described in Table 2</td>
<td>Workshops as described in Table 2</td>
<td>Workshops, as described in Table 2</td>
</tr>
<tr>
<td>· Workshops as described in Table 2</td>
<td>Firm-wide gatherings (1 presentation of the new collection, firm anniversary, 2 firm parties)</td>
<td>Firm-wide gatherings (1 presentation of the new collection, 2 firm parties)</td>
<td>Firm-wide gatherings (1 presentation of the new collection, 1 firm party)</td>
</tr>
<tr>
<td>Type of workshop - dates</td>
<td>Number of participants</td>
<td>Number of workshops</td>
<td>Main objective of workshops</td>
</tr>
<tr>
<td>------------------------------------------</td>
<td>------------------------</td>
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<td>-----------------------------------------------------------------------------------------------</td>
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<tr>
<td><strong>June 2002 to January 2003</strong></td>
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<tr>
<td>Weaknesses in the former processes in 2002</td>
<td></td>
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<tr>
<td>• Product development</td>
<td>40</td>
<td>1</td>
<td>• Identification of operational weaknesses, i.e. double-check loops</td>
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<tr>
<td>• Sourcing</td>
<td>20</td>
<td>1</td>
<td>• Brainstorming on possible improvements</td>
</tr>
<tr>
<td>• Order processing</td>
<td>30</td>
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<td></td>
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<tr>
<td>• Customer Relationship Management</td>
<td>20</td>
<td>1</td>
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<tr>
<td>• Production (in 4 different countries)</td>
<td>80</td>
<td>4</td>
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<tr>
<td><strong>October 2002 to January 2003</strong></td>
<td></td>
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<tr>
<td>Strategy</td>
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<td>14</td>
<td>• Translation of SBU-business plans into operations</td>
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<td>• Market Analysis (ECR &amp; PARTS)</td>
<td>10</td>
<td>2</td>
<td>• Strategic framing for process redesign</td>
</tr>
<tr>
<td>• Processes (Process &amp; Portfolio)</td>
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<tr>
<td>• Development (SEP, Evaluation, consol.)</td>
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<td>3</td>
<td></td>
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<tr>
<td>• Implementation (2 x BSC, Sourcing)</td>
<td>15</td>
<td>3</td>
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<tr>
<td>• Quality &amp; Review</td>
<td>15</td>
<td>4</td>
<td></td>
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<tr>
<td><strong>January 2003 to December 2004</strong></td>
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<tr>
<td>Process Redesign and Implementation</td>
<td>43</td>
<td>65</td>
<td>• Design and implementation of future processes with optimized interfaces</td>
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<td>• Product development</td>
<td>20</td>
<td>25</td>
<td>• Identification of SBU-specific and generic processes</td>
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<tr>
<td>• Sourcing</td>
<td>10</td>
<td>15</td>
<td></td>
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<tr>
<td>• Order processing</td>
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<td>20</td>
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<tr>
<td>• Customer Relationship Management</td>
<td>3</td>
<td>5</td>
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<tr>
<td><strong>October 2003 to February 2004</strong></td>
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<td></td>
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<tr>
<td>Selection of IT platforms</td>
<td>15</td>
<td>3</td>
<td>• Design of IT prototypes</td>
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<td></td>
<td></td>
<td></td>
<td>• Selection of future IT</td>
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<tr>
<td>Type of Evidence Used</td>
<td>Number of participants</td>
<td>Number of meetings</td>
<td>Main objective of meetings</td>
</tr>
<tr>
<td>----------------------------------------------</td>
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<td>------------------------------------------------------------------------------------------------</td>
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<tr>
<td><strong>June 2002 to December 2004</strong></td>
<td></td>
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</tbody>
</table>
| Regular Milestone Meetings                   | 10                     | 56                 | • Project management of the change project
• Verification of research layout and tentative findings                                           | • 30% more than 20 years with Fashion Inc.
• 40% more than 10 years
• 30% less than 2 years                                                                       |
| • Project review meetings with top management (twice a month)                                |                        |                    |                                                                                               |                                                                                  |
| Regular Project Meetings                     | 2-6*                   | 52                 | • Project management of the change project
• Verification of tentative findings                                                             | • 2 less than 3 years
• 3 between 10 and 20 years
• 2 more than 35 years **                                                                    |
| • Discussions with reengineering team members, middle and top management                     |                        |                    |                                                                                               |                                                                                  |
| Interviews                                   | 14                     | 14                 | • Develop an understanding for the setting & the structure
• Verification of findings                                                                    | • 20% more than 20 years with Fashion Inc.
• 50% more than 10 years
• 30% less than 2 years                                                                       |
| • General setting & Fashion Inc. structure    | 5                      | 5                  |                                                                                               |                                                                                  |
| • Historic Data & Development                 | 2                      | 2                  |                                                                                               |                                                                                  |
| • Verification of research results            | 7                      | 7                  |                                                                                               |                                                                                  |

* number changed due to vacation, sickness, retirement, etc.
** one member of the team retired and was replaced by a new employee