

**FENDING OFF COMMODITIZATION AND SOFTENING COMPETITION
THROUGH STRATEGIC BOUNDARY DESIGN**

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Abstract

Designing a firm's boundaries can lead to substantial strategic regeneration. But the question is, how? Moving beyond transaction-level analysis, we consider how the design of the firms' overall boundaries (rather than individual make-vs-buy choices) yield *strategic* advantages in addition to organizational benefits. We do so through in-depth analysis of a European textile manufacturer that disaggregated its vertical structure without changing its overall scope. We discuss how the change in value proposition from integrated final good provider, to outsourcee delivering a series of intermediate goods and services, yielded real benefit in a saturated market. We highlight the major strategic benefits of this vertical disaggregation, and consider how it changed both strategic prospects and industry dynamics. We show that this new structure allowed the firm to transform its monolithic structure into a vertically agile layout, enabling it to *reconfigure the scope of its offerings* to customers and, ultimately, to use reconfigurability as a strategic tool to fend off commoditization and segregate markets to soften the effects of competition. We identify the critical role of IT as a factor enabling the new flexible structure. We show that, in contrast to our expectations and the literature, it is *architectural technologies* such as ERP systems, rather than the technologies (such as EDI systems) linking firms, that enable reconfigurable modular structures. We examine the conditions under which such flexible vertical structures may be effective, identifying high maturity and low appropriability in our setting. We conclude with implications for theory and practice.

Keywords: Firm Boundaries; Re-configurability; Vertical Scope; Strategic Renewal; Modularity

As firms are facing an increasingly competitive environment, changes in firm boundaries are becoming commonplace. “Outsourcing” and “focusing on the core” are hot discussion items, not only in academia, but also in the public policy domain and company boardrooms; re-organizations and changes to vertical scope are the means being used by firms that want to adapt and strategically renew themselves. Yet, just how much do we understand about how changes to a firm’s boundaries lead to strategic advantage? And, when a firm wants to re-organize its previously integrated structure into a more open vertical layout, what are the steps that are required? Counter-intuitively perhaps, existing research does not directly address these issues. While we know much about the determinants of the choice to make vs. to buy, we know much less about how firms use boundary redesign to adapt and strategically renew, and the organizational and process requirements for the creation of such flexible, adaptable structures.

This paper builds on an emerging literature stream that shifts the focus from the canonical “make-or-buy” framing of Transaction Costs Economics (TCE; see Williamson, 1985), and considers the broader implications of boundary design for organizational and strategic renewal. Rather than analyzing one transaction at a time, and considering whether it makes sense for the organization to internalize or not, we focus on the *overall pattern and design of the firm’s boundaries* – and how it affects the organization (Jacobides & Billinger, 2006; Santos & Eisenhardt, 2005, 2006). That is, we allow for benefits that may not accrue at the level of an individual transaction, but which produce gains for the organization as a whole. Also, in contrast to the usual approach taken by TCE, we consider *strategizing* as opposed to primarily *economizing* as a driving force for boundary design (cf. Williamson, 1975, 1985).

Our focus is on the firm and how it uses its boundary design as a tool to improve its strategic prospects, and reduce the pressures of a price-driven commodity market. We look at a textile firm that drastically re-designed its value chain, becoming partly integrated and partly open to different (intermediate) markets along the value-adding process, and consider the *strategic* rationale for its doing so. Extending Jacobides & Billinger’s (2006) recent analysis on the *organizational* benefits of creating a “vertically permeable” structure, we focus here on the *strategic* desirability of this layout, examining how vertically permeable structures allow firms in mature sectors to renew themselves and alleviate the inevitable competitive pressures.

We find that this type of redesign allows firms to become more responsive and to capitalize on market opportunities; to offer new, vertically specialized services matched to their capabilities; to address market segments with higher margins; and to use the vertically focused segments as a lever enabling access to markets or services that previously were not open to them, often involving up-selling or cross-selling. More importantly, they undergo a “re-invention” from providers of *goods* to providers of *solutions*, in which their very “reconfigurability” (i.e. the ability to rapidly adapt resources in order to fit customer

needs) becomes the main means of strategic renewal, as it enables them to fend off commoditization, segregate markets and be competitive.

In addition to considering the strategic benefits of boundary re-design, and the rationale behind a “modular” vertical structure, our paper also investigates this structure’s *organizational requirements*. We thus extend the work on modularity and organization theory (Baldwin & Clark, 2000; Galunic & Eisenhardt, 2001; Helfat & Eisenhardt, 2004; Karim, 2006; Langlois, 2003; Schilling, 2000) by looking at the *specific processes and organizational changes* necessary for such a structure to emerge. That is, we complement existing research through an in-depth analysis at *process* level and ask how organizations adopt and implement such structures.

As the conceptualization of the problem in this paper is rather novel, the initial theory section is intentionally short. We discuss the empirical setting, and describe the data and methods, and then provide evidence on the strategic benefits of vertically permeable structures. We explore more deeply the organizational and technological requirements of this dynamic form, as well as the conditions that make it successful in our particular setting. This underlines the uniqueness of our case, which cannot be generalized at this stage, but which reveals the mechanisms required to understand the new organizational forms. We conclude the paper with some implications for research and practice, and by considering how firms can use strategic redesign to enable renewal, and confront the pressures exerted by their competitive environment.

Theoretical Background

The bodies of literature that are preoccupied with firm boundary issues are New Institutional Economics and TCE. The role of transaction costs (TC) which, at the margin, push firms towards vertical integration as opposed to procurement through the market, has been extensively researched (Shelanski & Klein, 1995; Williamson, 1985, 1999). In that literature, the primary interest is to analyze the transactional conditions which make it more efficient to integrate, when asset specificity and uncertainty is high, and frequency is low. The focus is primarily on *economizing*, as opposed to *strategizing*, as Williamson has repeatedly stressed. The results suggest that the greater the risks and potential costs of hold-up from using an outside party, the greater the propensity of a firm to internalize production rather than use. The focus has been on individual transactions, and integration is considered to be a response to market failure.

A more strategic approach can be found in Industrial Organization and the analysis of vertical integration (Joskow, 2005; Perry, 1989), which considers the conditions that push firms to strategically integrate

backwards or forwards.¹ The emphasis is on (often successive) monopolists or oligopolists, who would consider whether it is more profitable to integrate to capture greater oligopolistic rents; most of the research was theoretical, and empirical work has found little, and at best mixed evidence for such oligopolistic motivations, which have not been found to be prevalent in practice.

More recent research has considered the role of capabilities as they drive firms' scope (Argyres, 1996; Hoetker, 2005; Jacobides & Hitt, 2005; Leiblein & Miller, 2003). These authors find that the relative efficiency of a firm in the focal vertical segment is an important, often dominant determinant of the "make vs. buy" calculus, and this implies that firms will tend to specialize in areas where they have a comparative advantage (Barney, 1999). Similarly, some research has evoked the role of "real options", suggesting that a firm might want to integrate in an area where an option for profitable expansion may become available (Leiblein, 2003). Yet this has not explicated *how* firms should build boundaries.

The discussion of how firms use their *overall boundary design* to deliver comparative and competitive advantage is only now starting to be addressed by recent research on the *manifold boundaries of one organization*. Santos & Eisenhardt (2005) argue that firms use their boundaries (of ownership, power, and influence), or simply their vertical scope, to affect the nature of their competitive environment. Jacobides & Billinger (2006) suggest that if we look at the organization *as a whole*, we can see that the design of the firm's boundaries is predicated on delivering benefits for the organization as a whole, transcending individual transactions: They argue that permeable designs allow for a firm to benchmark its units with the competitive environment, increasing transparency, enhancing incentives, facilitating resource allocation, and opening up a firm to innovations made outside its own boundaries – infusing some of the market's discipline through the firm. This view is further developed by Santos et al. (2006), who found that boundary architecture can produce high performance if a firm extends the scope of activities, increases permeability, and improves internal modularity. This paper is aligned with this emerging line of research that focuses on *boundary design at the level of the organization overall*, which we feel holds much promise as a field of study. Its unique contribution consists of shedding light on the strategic rationale (rather than the organizational dynamic benefits) for adopting a particular vertical architecture, i.e. providing a fine-grained analysis of the benefits associated with a particular mode of interfacing with

¹ Most of the literature in Industrial Organization (Perry, 1989) focuses on oligopolistic explanations for integration. In imperfectly competitive industries, the pursuit of monopolistic or oligopolistic rents motivates integration: Firms may want to integrate in order to raise rivals' costs (Salop & Scheffman, 1983), control scarce resources (Porter, 1980), or eliminate multiple marginalization (Dixit, 1983; Salop, 1979), i.e. the problem of setting lower quantities than appropriate for profit maximization through reducing the output twice, once in the intermediate, and once in the final market. Alternatively, integration may be motivated by the desire to gain the ability to price discriminate, or to obtain a strategic upstream supply (Arrow, 1975; Riordan & Sappington, 1987; Stigler, 1951).

different markets along the value chain. It also explains what needs to happen for this structure to be adopted, a factor that has not been examined in depth to date.

While research might not have focused on the exact area we are interested in, we can usefully draw on parts of the research on modularity and organizational theory. Much of this work considers the potential upsides of a “modular system” compared to a “non-modular system” – as opposed to the potential benefits of adopting a more or less modular (or vertically permeable) structure (see Baldwin & Clark, 2000; Schilling, 2000). The adoption of “modular forms” is thought to be beneficial because they can increase efficiency (Schilling & Steensma, 2001), and also because they increase the ability of the constituent parts of the system to engage in innovation and exploration of different options, without the need to coordinate or be constrained by other parts of the system (Baldwin & Clark, 2000). Still, the focus is largely on the *systemic* benefits that accrue to a modular structure, rather than the specific advantages of re-configuration in a world characterized by competition from many different potential layouts.

Other studies have hinted at the potential benefits of a system with a modular structure. Galunic and Eisenhardt (2001), for instance, consider how firms can mix and match from a menu of existing capabilities, by creating different charters (i.e. combinations of capabilities and product-market areas of responsibility) in different divisions. Similarly, Eisenhardt and Brown (1999) introduce “patching” as a process that allows firms to realign their divisional structure by “adding, splitting, transferring, exiting, or combining chunks of businesses” (p. 74). Aligning and realigning resources is discussed in Karim and Mitchell (2004), which introduces reconfigurability of units as a purposeful experiment and search for new opportunities. These studies focus on *how to use a given repository of capabilities as a means to enter or create new markets* – a clearly distinct question from the more mundane (but also pressing) question of how firms manage their scope strategically, even in mature, highly competitive settings². That being said, we draw from this line of research, and in particular from the discussion of reconfigurability - an important concept, which can be usefully extended both by articulating its strategic rationale (especially *within* a given segment) and by examining how it comes about.

In this paper we focus on the narrower, but ill-understood question of how re-configurability can be used as a means to regenerate a firm’s positioning within its environment. Given the shift from integrated

² Relatedly, several studies have looked at the relationship between organizational structure, degree of modularity (which is indirectly related to which boundaries we want to address), and the creation of new businesses. Helfat and Eisenhardt (2004), for instance, focus on inter-temporal economies of scope in dynamic markets. They suggest that firms can benefit from an organizational form that consists of a modular structure. In particular, the recombination of organizational units allows firms to match changing business opportunities along an evolving path of related diversification over time. And in nascent markets, Santos and Eisenhardt (2006) found that entrepreneurs use distinct processes to co-construct the boundaries between their firms and the market. Our focus is narrower, as we concern ourselves with the design along a given sector’s value chain.

products to tailored services and offerings (see e.g. Heskett et al., 1994), we feel that this analysis will improve our understanding of why and how firms recombine, changing the nature of their product offerings. Rather than analyzing firms' ability to identify new markets or new opportunities through a re-deployment of their divisional resources more broadly and at a higher level of abstraction, we focus on analyzing the company's vertical structure³. Thus, instead of considering how corporations go into new markets by establishing new units, we consider how firms, *even if they stay in the same business*, can create and seize new opportunities by strategically managing their boundaries and adopting a permeable structure.

Another area that we are interested in, as it has also received scant attention, is the way in which "modular" (or, in our case, vertically permeable) structures come about. While much of the existing research makes reference to modularity, the investigation of what this really means is still in its infancy. Indeed, as MacDuffie (2006) finds, in the automobile sector, the general discussion on "modular structures" consists more of a metaphor than of anything that approximates the forms that are discussed in the literature, so much so that the infatuation with the concept may have obscured what actually is changing, how structures are different. This is another area we aspire to shed light on - the specific details of how a firm that *did* adopt a modular structure managed to do so. Finally, we want to shed light on the dynamics of *how* such vertically flexible structures, which can be as useful to outsourcees as outsourcers, work. We examine "the specific micro-processes and roles that form capabilities [that existing research has neglected]" (Galunic & Eisenhardt, 2001: 1229) and study in some detail how "the reconfiguration of modular units ... [can help us] unveil the dynamics within organizations at a more granular level" (Karim, 2006: 801)⁴. Here, we will look at the organization in some detail, focusing on how the organizational "process grammar" needs to change within organizations (Salancik & Leblebici, 1988). So rather than studying the reconfiguration of units, we consider how firms structure individual tasks as a sequence of activities, and how the use of intermediate and final markets along the value-adding process requires that firms revise their organizational grammar. We consider how linking to markets can only occur if the requisite ordering and sequencing of tasks is in place (Pentland, 1994, 1995).

³ Although the terms reconfiguration and recombination are used interchangeably in many contexts, recombination actually refers to the interactions between one or more components, and reconfigurability "may also involve components being added, deleted from, or moved within a firm" (for a discussion see Karim, 2006: 803).

⁴ Note that, because of the level of detail required, we chose a relatively stable setting in which we could isolate the firm's rationale for changing its structure, and the steps taken to implement it. Our setting is within a well-established, mature market with well-defined product bounds. Moreover, we chose a firm whose scope did not change; no new units were added in a bid to capture shares in emerging markets. Only the level of its organizational (i.e. process) modularity changed, and its boundaries along the value chain were opened up. This made our empirical task manageable, as we could focus on a narrower slice of reality- albeit one that could be of interest to a number of corporations.

To summarize so far, research has only recently started to examine how firms shape their *overall* boundaries to gain advantage. Due to the dominance of TCE research, most of the theoretical and empirical work that has been done is based on the factors that determine “transactional alignment,” one transaction at a time. Yet recent research suggests that, in addition to factors that affect individual transactions, there might be some overarching strategic logic for how boundaries are set. Indeed, it may be this overarching logic that allows organizations to renew themselves through efficient boundary design. This paper complements recent attempts to document the “systemic benefits” of organizational boundary design, by focusing on the *strategic advantages* of setting boundaries and, in particular, the desirability of adopting a “vertically permeable structure” that helps to cement a firm’s competitive position. This paper complements, but is clearly distinct from, research on the desirability of modular structures; our focus is on *the choice of vertical scope and its strategic rationale*. We do not address how firms attack new and completely different segments by recombining their capabilities; rather, we focus on how they are able to restructure their offerings within existing markets.

Thus, although our theoretical framework may be based on a set of fairly distinct bodies of knowledge, we feel that the phenomena are sufficiently novel to require inductive, theory-building work that will help us address new questions: How do firms redesign their boundaries to ensure strategic renewal? And what are the concrete organizational and technological requirements for achievement of the dynamic boundary design that can help a firm to proactively position itself in its competitive environment?

Methods, Data and Setting

Methods

This research is based on a case study of Fashion Inc., a major European garment designer and manufacturer selling primarily to department stores and independent retailers of men’s women’s and children’s clothing. Fashion Inc. employed almost 4,000 people across Europe. Its biggest unit’s (Service Unit) 2002 revenues were in excess of €250 million. Our qualitative study involved some 48 months of direct observation of key parts of the corporation’s redesign and IT implementation processes. The choice of setting was made on conceptual grounds, not because the firm was necessarily representative (Firestone, 1993). When we began our observation Fashion Inc. was planning large-scale changes to its organizational design, involving implementation of a new ERP. This provided variance for both our dependent and independent variables.

Our data sources included industry publications and manuals, company documentation, archival data, participation in workshops, and employee interviews. We were looking for evidence to inform existing theory; we drew on both existing constructs to guide our work, as well as emerging constructs. Our aim was to examine: (a) how organizational form and functions of the firm were changed; (b) how the firm

redesigned its business processes; (c) how the new ERP system was implemented; and (d) the impact of IT on intra-organizational design.

Participant observation and theory generation were cyclical: as constructs were identified and theoretical frameworks were created, we sought clarification in the data, which in turn led to further theory development (Yin, 1994). We communicated these developing theories and our conceptualizations with industry participants and also with other researchers who had studied the company.

Data

In May 2002 when we began our research, the company was considering changes to its vertical structure and organizational design. The first of the study's three main phases began in June 2002.

Throughout the course of the study we reviewed a range of internal documentation, including the new Strategic Business Units' (SBU) business plans, details of their structure and processes, and employee surveys. Fashion Inc.'s senior management discussed the company's change process at the re-engineering team's twice-monthly milestone workshops, which we attended. We also participated in 146 internal workshops, which were initiated by top management. We were able to attend many of the firm's meetings that related specifically to organizational design changes. Thus, it can be seen that we had excellent access to data, and first-hand experience of the organizational redesign process. The data sources and how the evidence was used are reported in Table 1.

Table 2 lists the internal workshops during which proposals for changes to Fashion Inc.'s vertical structure and organizational design were debated. Participation in these 146 workshops included relevant employees and top management. As changes were implemented, top management signed-off on action every two weeks. There was a quite unique level of inter-subjective agreement on both the nature and drivers of organizational change.

The firm was determined to keep an accurate record of the change process; thus minutes of all workshops were transcribed. Before being stored in the company archives, workshop participants were allowed to review these transcriptions, which ensured accuracy. We were allowed to use them to augment and confirm our interpretations. In return, the company reviewed our progress reports, which ensured that our understanding of the change process was accurate.

Include Tables 1 & 2 about here

In phase 1 (June 2002 to January 2003) we made a general study of the industry, and to familiarize ourselves with Fashion Inc. we conducted interviews with 116 of its employees. In order to understand the problems that were being raised by Fashion Inc.'s organizational change process, we held weekly discussions with the re-engineering team and met with senior management twice a month; we also participated in eight workshops involving 205 employees. Between October 2002 and mid-January 2003,

14 strategy workshops, involving 75 employees, were held to discuss the implementation of these changes; we attended all of these. The timing of phase 2 was February 2003 to February 2004, and involved our attendance at 65 workshops, involving 43 employees, in the course of which the new organizational design was finalized.

We reviewed documentation on Fashion Inc.'s IT infrastructure (networks, personal computers, shared data, servers, etc.) and IT selection process. Phase 3, February 2004 and May 2006, involved collection of additional data to clarify and confirm our theory. Throughout the study we maintained regular contact with the company and were kept up to date with changes. From time to time, we met with internal re-engineers and managers, and conducted 35 interviews with a range of Fashion Inc.'s employees (see Table 2).

Several IT consultants contacted during the research offered assistance and we conducted 15 semi-structured interviews with consultants (see Table 2). The purpose of this set of interviews was to obtain information on new emerging IT functionalities, in particular new network functionalities in ERP systems. These consultants also provided input which improved the generalizability of our findings. They had access to an extensive database of 125 ERP systems, comparing over 2,500 ERP functionalities. The database, which was created in the early 1980s, is updated annually, and has been used by more than 250 companies to select an appropriate ERP system. We were given only limited access to the dataset, but consultants were very cooperative, and answered our questions about general ERP functionalities and their evolution over time.

Setting

Fashion Inc. is an established garment manufacturer with a recognized brand. The only stage of the value chain in which it had no involvement was production of fiber (see Figure 1), which it sourced externally: it had Fabric, and Cut, Make and Trim (CMT) facilities - mostly in Eastern Europe, and design and logistics departments at its Western Europe headquarters. Fashion Inc.'s main customers were independent retailers and major department stores. However, the decline of these types of distributor, and regionally focused branding, led to a crisis in the late 1990s. Fashion Inc. was itself unable to sell effectively (as the relative position of its retailers was diminishing) and even when it found shelf space, its products had to compete with other strong brands. Downstream weaknesses in sales, marketing and distribution were resulting in heavy financial losses, and indeed, the prospects of the retail market as a whole were rather bleak. All mid-priced brands in the garment market were coming under severe pressure (DeutscheBank, 2002) and Fashion Inc.'s strategy for growing its own particular brand was not sustainable. Fashion Inc.'s marketing department manager was quite clear that increasing the market share of its own brand would require a major investment in marketing, and would not be guaranteed. Emphasizing Original Brand Name Manufacturing (OBM) and reducing the focus on manufacturing, (i.e.

outsourcing it), was a risk that the corporation was not prepared to take as it did not sit well with its comparative strengths. Fashion Inc. was unable to capitalize on its traditional advantage in the Fabric and CMT segments (see Figure 1), as weakness and volatility in OBM were becoming a huge problem.

Include Figure 1 & 2 about here

Fashion Inc. took the radical decision to re-design its boundaries and make its new structure a tool to improve its response to an increasingly competitive environment. The goal was to create a new value chain setup and, in particular, to devise a new way for the company to connect to different markets. Fashion Inc therefore disaggregated vertically, and established three SBUs along its value chain: Fabric, CMT, and Service (see Figure 2). Fashion Inc. “opened up” its boundaries but rather than splitting into discrete parts, or dropping some part of the production process, it became both a buyer and a seller in intermediate markets in which it had not previously participated. Fashion Inc. as a corporation encompassed remarkable variety in the nature of the different units, based on whether they bought their inputs or produced them in-house, whether they used intermediate markets or went into joint production with external partners. This new strategy involved a substantial transformation process in Fashion Inc., which included the modularization and redesign of all major business processes and the implementation of a new IT infrastructure.

As Figure 2 shows, Fashion Inc. became both integrated, and open to multiple intermediate markets along the value-adding process. This “vertically permeable” structure, described in Jacobides & Billinger (2006), fostered more effective and efficient operation by enabling regular internal and external benchmarking of in-house operations. This allowed the firm to improve the match between its capabilities and capacity utilization along the value chain. In addition, Fashion Inc.’s new vertical structure yielded dynamic benefits through the development of strategic capabilities at the corporate level. For instance, “tapered” vertical integration (Harrigan, 1985) was used by Fashion Inc. to provide support for systemic innovation and quality management/improvement processes along the value chain. At the same time, the use of outside intermediate goods and services encouraged greater absorptive capacity (Cohen & Levinthal, 1990) and greater innovation (Chesbrough, 2003). Also, the “permeable” vertical structure enabled resources to be channelled more appropriately within the organization. Increased permeability allows identification of the most deserving parts of the firm, thus preventing the weakest parts of the value chain from becoming bottlenecks that impede progress. (see Bower, 1974; Burgelman, 1991; Tushman & O'Reilly, 1997).

While this vertically permeable structure had an impact on the nature and functioning of the organization, it also substantially affected Fashion Inc.’s positioning in (intermediate) markets. It changed Fashion Inc’s value proposition; this new, more dynamic structure allowed it to fend off commoditization in ways

that previously were not possible. This new structure has been credited with much of Fashion Inc.'s reversal of fortune to become the (profitable) exception in a very competitive industry.

The following sections revolve around the analysis of how Fashion Inc. used this new, modular value chain design to change its positioning and renew itself. We also look at the equally important organizational, technological and process-based changes that were needed for such a dynamic, strategically resilient structure, and we elaborate on the preconditions necessary to make such a structure successful, noting the importance of industry maturity and the existence of clear demarcations along the industry's (albeit not the firm's) value chain.

Why Modularize the Value Chain? From Organizational to Strategic Benefits

The Strategic Benefits of Opening up the Value Chain: Matching and Capitalizing on Market Demand

The first implication of Fashion Inc.'s change in vertical structure was that it became able to respond to focused market needs more quickly and more effectively. The company was able to do substantially more than offer the final product; the scope of the firm was able to be managed dynamically to respond to customers' needs and cost conditions. This was the result of a new method of putting together "packages" that responded to current needs. In the past, customers could only buy the final product – and Fashion Inc. offered a standard product (e.g. an apparel collection) that it had in stock, or that it could produce within a given timeframe (an important issue, as responsiveness was essential in this sector - see Richardson, 1996). After its redesign, Fashion Inc. was able to respond to wider needs, as it was able to make effective use of outside manufacturing capacity and internal processing capacity to provide a swift response to any demand. As a manager in the Fabric Unit described that under the new structure, they could deliver much more than before: "...when we receive an unexpected call from a customer who asks for a particular product, we first see if we have the product in our warehouse: ... if yes, we just ship it ... if no, we see whether we have the raw fabric for the product in stock ... if yes, we can very easily produce it ... if no, we need to see where to get the raw fabric, internally or externally." Thus, Fashion Inc. is able to *capitalize better* on demand, assess the profitability of a potential product, and decide whether to produce it inhouse. Existing stocks and capacities can constrain the firm to focus only on its current inventory.

More important, the new structure allowed Fashion Inc. to make a better-calibrated decision about how much of its own capacity and how much of those of its providers along the value chain would be used. In this respect, its new IT system, which we discuss later in the paper, has provided a very important capability to compare different scenarios and to create *appropriate bundles of offerings*, which draw from inside Fashion Inc. and outside it. As several production planners noted, "we can now optimize these scenarios." That is, production planners are able, through the new IT system, to use different operational measures to select the most appropriate service/offering bundles. This allows Fashion Inc.'s planners to

provide a more flexible response to market needs, while choosing the most effective level of integration for the company – committing the stages of the value chain that could be gainfully employed, and relying on outside providers for what is not easily to hand. For example, the Fabric Unit has several external partners that are specialists in fabric dyeing and fabric refinement. As a result, the Fabric Unit created capability bundles that include the use of a particular external value-adding process (see Figure 3). Certain customer orders might require that the Fabric Unit externally sources a fiber, knits the raw fabric internally, sends the raw fabric to the external dyeing-specialist, receives dyed fabric, refines the fabric internally, and ships it to the final customer (we elaborate on this below). Every capability bundle has its own distinct vertical scope; and because Fashion Inc. has numerous different capability bundles, the vertical scope of the firm changes dynamically and sometimes fairly dramatically. Thus, all of its capabilities, wherever they are located along the value chain, can be gainfully employed – and if the involvement of outside parties is needed, this too can be accommodated.

Insert Figure 3 about here

Adjusting Scope, Vertically Specialized Services and Upselling

The new structure did more than just achieve effective utilization of the firms' capabilities. In addition to allowing Fashion Inc. to use a variety of capability bundles to deliver *any given set of goods (or services)*, it also enabled a more complex set of offerings. Not only can Fashion Inc. offer finished products, it sells a variety of intermediate products, or *customized bundles* of goods and services depending on market needs. For example, it sells specialized services to customers that need them – textile manufacturers interested in capacity for CMT (to respond to seasonal demand) - or those that had recently exited one part of the value chain. In addition, over and above its individual service offerings, it provided an “interface” with the client. For instance, the upstream Fabric Unit had a number of relationships with garment producers who were keen to ensure they teamed up with an innovative fabric producer. So Fashion Inc. provided fabric expertise (since it could not out-compete these branded manufacturers by moving downstream), and the Fabric Unit offered its focused expertise.

The Fabric Unit opened the door to greater offerings of ancillary services throughout the value chain, focusing on the *specific needs* of the client⁵. For instance, on the basis of its original business plan, the Fabric Unit produced some fairly innovative fabric. The Fabric Unit's clients considered cutting, making and trimming to be a relatively unimportant activity, “because everybody can do it.” Their primary

⁵ The coordination between the units was based on transfer pricing, which used market prices, and a balanced incentive system for managers (bonuses were based 50% on SBU and 50% on corporate performance). In addition, the modularization meant that individual processes were costed independently, so charging a service to another internal (or external) unit was fairly straightforward, and also, several customers wanted very specific, individual processes. Market prices were therefore fairly well understood, helped by the fact that the industry is very mature and has many well-established product standardizations.

interest was in fabric; they asked Fashion Inc.'s Fabric Unit if they had "some local CMT providers" – which was the opportunity for Fashion Inc. to offer both fabric and services. The Fabric Unit provided the interface with the client and organized provision of CMT services. In another case, the Fabric Unit not only "upsold" processes from the CMT Unit, but also negotiated provision of R&D capabilities from the Service Unit. Fashion Inc. capitalized on all these opportunities and ensured that its units were market-facing and poised to respond. Every unit along its value chain had a distinct strategic profile that targeted a particular market, but, if customer demand was there, or a market opportunity emerged, was able to provide services that went beyond what the SBUs might normally offer. Interestingly, Fashion Inc. initially did not envisage inter-divisional cross-selling or up-selling as part of the SBU's activities. However, after the SBUs were launched and these opportunities emerged, Fashion Inc. naturally did not demur.

The ability to offer specialized products or services with a vertical focus, and also to up-sell and cross-sell was enhanced by Fashion Inc.'s technological infrastructure, which allowed it to respond (almost) in real time. This was particularly valuable in the textiles/garment setting, given the short life-cycles and need for a rapid response in this industry (Richardson, 1996). As a manager from the Fabric Unit said: "We can deliver add-ons quickly, because we have many of them somewhere in our network." We would add that this was also because the internal system of Fashion Inc. allowed the firm to identify and offer these specialized capabilities.

Customization and De-commoditization

The push for these services also led to the identification of new offerings – i.e., the creation of new services that made Fashion Inc. the collaborator of choice for companies that were abandoning their manufacturing, and retreating in brand management and design. The Service Unit's market, for instance, introduced advanced services such as the provision of floor management and stock management. It was accepted that Fashion Inc. would become more competitive, but the general view was that Fashion Inc. could not win in the branding race, and therefore would benefit most from becoming the "outsourcing partner" of choice, focusing on the types of value-added that are less transparent and more profitable. The director responsible for marketing Fashion Inc.'s own brand (who was also responsible for about 150 sales agents) summarized these advances by saying: "If we want to sell a white tee-shirt only, we are out of business. Floor management, and other activities, drive the market!" In addition, the head of the export division summed up the previous situation with the words: "We [i.e. Fashion Inc.'s own brand] are in the premium quality segment – however, this doesn't really help if everybody has premium quality. You need add-ons that offer more." Thus, Fashion Inc, instead of focusing exclusively on brands (a strategy that frequently failed as worldwide brands ousted many mid-sized players) included value-adding and innovative bundles, and fostered the development of these new, entrepreneurial opportunities.

Over and above their greater responsiveness, the ability to offer more options to customers (whether involving internal or external sourcing and capacities) and the ability to offer and up-sell/cross-sell vertically specialized capabilities (including entirely “new” service offerings), Fashion Inc. was becoming a “solutions” company – a trend occurring in other sectors when firms try to avoid commoditization by providing customized packages of services and products. The fact that its new focus was provision of *customized* bundles meant that its offerings faced less competition, which, as Fashion Inc.’s executives noted, allowed it to make bigger profits. So Fashion Inc. managed to segregate certain market niches in which there were only a few competitors – especially because Fashion Inc.’s reconfigurable structure allowed for a variety of add-ons, such as the Fabric Unit, using the Service Unit’s R&D capabilities, or the CMT Unit using the Service Unit’s garment design capabilities (see also Table 3). This led to quite unexpected success, since the initial “push” in the form of industrial customers demanding the new products and services, was soon replaced by a “pull” from market participants, leading to full use of the capacity of entities such as the Service Unit.

Insert Table 3 about here

Fashion Inc. used reconfigurable capability bundles to target the emerging market opportunities and offer more advanced services in the various markets along the value chain. To illustrate, the Service Unit exploited its sales force’s knowledge about how to sell garments, and got them to shift their focus from selling Fashion Inc.’s garments, to ensuring that the firm’s *clients* could sell as many garments as possible. Because Fashion Inc.’s sales force was very experienced, it was able to produce good results based on this expertise in what sells, in which location, and under which conditions. By unbundling their compensation from *sale of Fashion Inc garments*, and rewarding them on the basis of units sold to retailers in a specific time, Fashion Inc. could claim to be offering “solutions” to the client, and focusing on the provision of more than “just products”. So Fashion Inc. leveraged the already existing, “embedded” capability of its captive sales force, and enabled them to provide a new offering to retailers that provided a “solution” for the customer – and which produced better margins for the company⁶.

The development of the floor management offering also reveals that ‘fighting commoditization’ required the development of skills that were *beyond* the industry’s known standards. Fashion Inc. focused on how it could profit from its knowledge about cultural differences, fashion tastes, and shopping behaviors in a variety of regions, to provide a unique offering that would increase its margins, as opposed to competing in final products.

⁶ This being said, a learning process was required. The conversion did not happen over night, but required some ‘trial and error’ testing with customers, who were willing (and eager) to cooperate in this (mutual) learning.

As Fashion Inc. increasingly positioned itself as a provider of solutions, rather than just products (or services), it gained another advantage: the gradual elimination of would-be competitors. As a sales department manager remarked: “many of the smaller guys cannot deliver what we offer.” Advanced floor management required the planning of seasonal replenishment cycles for various product categories, the continuous optimization of inventory levels and provision of updated store fittings to match the latest fashion trends, all of which required extensive knowledge and experience of the entire value chain. Furthermore, these services involved sophisticated capabilities as well as a state-of-the-art ERP system – which, as we shall see, was at the core of Fashion Inc.’s ability to offer reconfigurable packages. Thus, only few firms had the capacity to offer a similar combined service; those that tried to generally lacked some key parts of the knowledge. In the words of one sales manager, “many of those who compete with us in the ‘solutions’ space are really good at logistics, but oftentimes they don’t really understand our industry.”

From the Strategic Benefits of Vertical Permeability to the Organizational Preconditions

This discussion suggests that firms similar to Fashion Inc. might be able to avoid commoditization by modularizing their value chain and creating structures that allow them to interface with different intermediate markets. Firms become able to respond more effectively to existing demand by combining forces with other firms; they are able to tap into other vertically specialized services, many of which are less intensely competitive; they are able to provide bundles of services and products that up-sell, and as such utilize market contacts throughout the value chain to identify and create new opportunities; and they are able to shift to the provisions of *solutions*, through flexible provision of selected services. Thus, in addition to helping a firm’s *organization* (cf. Jacobides & Billinger, 2006), reconfigurability supports *strategic renewal* by changing market positioning, and facilitates the development of valuable capabilities.

However, the question is, what is it that enables such a structure in the first place? What are the organizational requirements for a firm to become reconfigurable? What can we learn by delving into the process, and assessing the costs and requirements of restructuring?

How does a firm attain Vertical Reconfigurability?

Following the decision of Fashion Inc.’s executives to disaggregate the firm’s structure and implement a reconfigurable vertical structure, a major redesign effort began, which required a complete redesign to accommodate modular interfaces between business units. These incorporated the standardization of

information, routines and governance modes between the business units, and modular design of products and services (Baldwin & Clark, 2000; Sanchez & Mahoney, 1996).⁷

An example of the process redesign and its impact on Fashion Inc.'s permeability, can be seen in the system of order processing for "key accounts" (i.e. orders from long established customers), depicted in Figure 4. Before redesign, key account orders for apparel were processed by the customer service department, which checked with product management and production planning to confirm the feasibility of filling the orders. If there was no spare capacity, the order was passed to the key account manager who checked with logistics and the warehouse. If it was eventually established that the order could not be filled, it was the responsibility of the key account manager to inform the customer. This system involved five different departments, and substantial time and capacity costs. It emanated from Fashion Inc.'s old ERP system, which could only provide certain information, which led to manually operated routines. Addressing customized requests was reliant on ad hoc solutions, i.e. the interplay between the five departments on the basis of personal interaction and inter-personal authority. If this system had been replicated in the SBUs, the overall complexity of the accumulated processes would have become unmanageable. Another example is the provision of an intermediate service. Frequently, Fashion Inc. was asked to subcontract "unused" manufacturing capacity in the Fabric and CMT SBU's, to other firms. Before processes were redesigned, this occurred in a limited and unsystematic way, and although such use of spare capacity would have been profitable, and would have increased the capacity usage of the firm, the processes to allow Fashion Inc. to offer these intermediate services were not in place (see Figure 4, right side). Requests did not go through any standardized process, and did not allow managers to find a way of "interfacing" with the market. Even when it was felt the service could be offered, the related processes were highly location - or even manager - specific. Thus, in the absence of an organizational blueprint and the requisite IT for a generic "intermediate goods" order process, permeability at intermediate points in the value chain could not be achieved.⁸

Insert Figures 4 & 5 about here

⁷ The redesign process, of course, was not quite as orderly and linear as this description implies. The opportunities for accessing new intermediate markets did not emerge only as the result of a top-down analytical approach; they also appeared earlier as sporadic, unsystematic efforts to capitalize on the opportunities in different parts of the value chain. For instance, CMT managers had been asked about potential use of their idle capacity and were fully aware of the prospects - indeed, this precipitated the institution of the vertically permeable structure. Thus, in reality, the process of organizational redesign was successful because it managed to blend effectively the messy, bottom-up process with the rationalized, top-down redesign initiative.

⁸ Much as order processing was the firm's generic interface on the customer side, the sourcing process was the generic interface on the supply side. The sourcing process involved challenges that were comparable to those described for order processing. Hence, a similar redesign effort was required to create a generically defined sourcing process.

Process and IT redesign addressed these shortcomings. After process redesign and implementation of the new ERP system (depicted in Figure 5), procedures were rationalized, and sales to intermediate markets became possible: in other words, these changes to the administrative processes made Fashion Inc.'s SBUs more flexible, and allowed them to deal with its in-house units as well as with outside agents. The new processes relied heavily on IT and allowed for processing of customer orders and inquiries to be standardized, regardless of whether they were generated internally or came from another company. Every SBU had a customer service centre, which could provide final or intermediate goods and services.

Modularity at work: Organizational unbundling and organizational disintegration

The redesign started with process re-engineering because management believed that the corporation's strategic choice to disaggregate could be best served by a well-defined process structure with standardized intra- and inter-organizational interfaces (see Figure 2). The CEO, in a major announcement, summed it up thus: "during the process redesign, we do *not* look at the existing IT systems or the organizational structure, but focus on the best way of doing things at the process level." His conviction was that strategy first translates into processes, which then require an organizational structure. The IT applications were seen as the enablers of the resulting organizational design and realization of required IT functionalities. Even *before* any change was initiated, the head of the design department had said, "we need a PDM [Product Data Management] system", and both the CEO and the Chief Information Officer had articulated the need for "a new ERP system." So the process and organizational redesign were undertaken in response to a *perceived need* and with confidence that state-of-the-art IT applications would enable the newly designed modular processes.

The nature of this change effort and the way IT combined with new processes to change the organizational design, require closer attention. Organizational redesign, and the creation of more clearly distinct sub-units, occurred along two dimensions. One was organizational disintegration along the value chain, i.e. the break down into three vertically linked SBUs (Fabric, CMT, and Service, depicted in Figure 1). The rationale for this form of dis-aggregation was the need to address intermediate markets along the value chain, and infuse the firm with discipline and information from market-based benchmarking. Second, Fashion Inc. pursued organizational unbundling *within* each SBU. It disaggregated the functional business processes *within* each value-adding step of the value chain by clearly isolating customer relationship, infrastructure and product innovation management (see Hagel & Singer, 1999). Thus, Fashion Inc. both unbundled within each step of the value chain, and disintegrated by separating parts of the value-adding process. The new organizational layout and the firm's process architecture are depicted in Figure 6.

Insert Figure 6 about here

The objective of organizational unbundling was the modularization of organizational processes (Sanchez & Mahoney, 1996; Schilling & Steensma, 2001)⁹, which allowed for a greater degree of flexibility in terms of Fashion Inc.'s process grammar (Pentland, 1994, 1995). That is, it changed the way the firm responded to market needs by putting together an appropriate set of elementary and partially generic business processes. For instance, Fashion Inc.'s order process consisted of customer service (e.g. based on a call center), warehouse management, and inbound and outbound logistics. All these sub-processes had been highly interconnected in the previous corporate structure and essentially consisted of an integrated bundle without a flexible process grammar. As a result, all customer orders had to go through *all* these processes due to the limited functionality of the old ERP system. Therefore, it was not possible to organize direct shipments from supplier to customer, or to bypass Fashion Inc.'s warehouse, and inbound and outbound logistics. The organizational unbundling and disintegration, bypassing *some* parts of Fashion Inc.'s value chain, meant that a "custom package" became possible. Organizational unbundling and its associated modularization of sub-processes enabled this alternative vertically flexible way of handling customer orders.

To achieve such flexibility and modularity though, it was necessary for Fashion Inc. to define and examine every process within its boundaries, identify the interdependencies with other processes, and evaluate the opportunities for centrally organized processes, which were operated at the corporate level. The result of this very intensive exercise was an internal value chain comprising modular processes in distinct steps of the value-adding process, most of which were well-defined in terms of intra-organizational interfaces and responsibilities (Zenger & Hesterly, 1997). The organization thus created a set of building blocks, which were intended to be the basis for sets of activities that could be offered to outside or inside clients (see Figures 1, 2 and 7).

The Preconditions for creating a permeable structure: Where it works and where it does *not* work

In analyzing a case such as Fashion Inc., where the permeable structure was known to work, we were keenly aware of the dangers of unduly generalizing our findings. While our focus had been primarily to understand the strategic logic through which such solutions *do* work (when they do), as well as the organizational requirements to make them possible, we also ventured into the "boundary conditions" that explain when we would expect vertically permeable structures to emerge. To do so, we asked managers why this structure would be effective, and also considered the conditions under which such a structure might not work, focusing on the parts of Fashion Inc.'s value chain that remained more integrated.

⁹ The widely discussed modularization of products is less relevant in this setting, due to well-established industry-wide standards, such as raw fabric or refined fabric.

This section briefly summarizes our findings. First, we report some relevant market characteristics; second, we consider the role of the technological and product structure (i.e. the extent of product modularity in our setting); and third, we provide some concrete examples of where Fashion Inc. tried to introduce a more permeable structure, but was not successful.

Industry characteristics

An important feature, which we believe underlies much of the relative success of a permeable structure, concerns industry maturity (Gereffi, 1999). Textiles may be the oldest industrial sector in the world and, more importantly, do not offer much prospect for profitable growth. The added pressure of cheap labor, initially from Eastern Europe and later from South-East Asia (China, India and Bangladesh in particular) meant that the segment in which Fashion Inc. operated was either shrinking, or, at best, maintaining the same level. To achieve growth, new solutions were needed – and the new structures were profitable. We speculate that in higher-growth industries, where successful firms can leverage their advantage in one part of the value chain by building a strong position, greater integration might take place

This intense competitive structure in the sector has led to the clear emergence of distinct business models, each with a different scope, and each with a different logic. Some are based on the old adage “focus on your core competencies”, and have kept parts of the distribution and design, and outsourced some production, being ignorant about how successful firms further upstream might be. Other firms, such as Zara, operate in many steps of the value chain, gaining the advantage of “quick response” to offset any higher costs. The logic of the former structure does not need elaboration; it is the received wisdom on how firms should manage their scope (Barney, 1996; Grant, 2005; Jacobides & Winter, 2006). The logic of firms like Zara has been briefly discussed, by Richardson (1996) and Ghemawat & Nueno (2003). The logic of Fashion Inc., though, which we feel is interesting *given this challenging industry environment*, is worth considering more deeply, and drawing lessons from.

Value Chain Structure and Product Architecture

If it were not for the existence of fairly well demarcated steps in the value-adding process, with clear intermediate markets for fabric, or for CMT operations, it would be hard for Fashion Inc. to implement its structure. However, it is interesting that Fashion Inc. only “discovered” this fact after it decided to engage in the value chain re-design, and conducted a more thorough examination through a top-down process. What Fashion Inc. discovered was doubly rewarding: First, there were vertical specialists along the value chain, with established modes of operation; thus, it did not have to bear the cost of “setting up” a new intermediate market (cf. Jacobides, 2005). Second, many of these vertically specialized participants, who were operating beyond the radar of the major companies, were “mom and pop” shops, and as such, for more advanced participants such as Fashion Inc., offered some interesting opportunities. Relatedly, this

sector had a number of well-specified, clearly delineated “stages” and modules and thus is quite unlike emerging sectors with fluid or fuzzy boundaries between products and services (Baldwin & Clark, 2006).

However, it should be noted that while *market* and *product* structure in Fashion Inc. were modular, the firm structure, prior to the BPR and value chain re-design, was not; and so was not the industry, as one manager stated: “We were all set up to be vertically integrated.” So while products were highly standardized and were actually a good foundation for a commodity market of this nature, the processes to produce these commodity products were often not standardized. This is what made the organizational unbundling and organizational disintegration to accomplish this goal costly.

Stepping outside the boundary conditions: When reconfigurability did not work

In addition to considering the factors that made this structure strategically desirable, we also looked at the factors that might have made Fashion Inc.’s executives decide *against* opening up the firm’s boundaries. In particular, we focused on the markets where Fashion Inc. was more integrated, and did not participate as a potential seller and/or buyer, and asked the questions: Why would Fashion Inc. not want to open up its boundaries? What were the problems or shortcomings here? The answers we obtained referred to three categories of concerns: issues related to the market along the value chain (scale, size, or relative advantage to be monetized); problems that would emerge from “opening up” the value chain, i.e. problems of coordination if a permeable structure was adopted; and issues of strategic control, i.e. concern with providing crucial inputs to competitors, or interfering with downstream competitive and collaborative relations.

Starting with concerns related to the underlying vertical/specialized market, executives felt that either the scale was too small to justify focused attention (“too small a market”, as one executive put it), or there were substantial costs involved in organizing the provision of a specialized service, i.e. the “mundane transaction costs” of linking and liaising with potential customers (Baldwin & Clark, 2006; Langlois, 1992) were too great. As a senior manager observed on implementing a new vertically focused market: “it’s too much of a hassle so it won’t pay off”

Interestingly, while Fashion Inc. did try to create new bundles (“the variety of products and services that we offer now, is getting more and more unique within our industry”, said one manager), it still based its bundles on known “building blocks” of products and services. It had tried innovating even within these elementary “building blocks”, i.e. it had tried to create new sub-markets. For instance, Fashion Inc. tried to implement a particular type of advanced floor management in some of its outlet stores; however, it became too difficult to manage; as one member of the reengineering team said (with a smile): “Well, this package [i.e. this capability bundle] is too difficult for our outlet guys.” And after several internal discussions Fashion Inc. concluded that it would not offer this package to external customers.

The second type of concern was over problems that breaking up and modularizing would entail for the rest of Fashion Inc.'s operations; breaking up would make the corporate structure too complicated for the boundedly rational, pressed-for-time executives, especially those at the most senior levels. For instance, corporate management would occasionally veto individual units' requests to become *more* permeable, in order to maintain a degree of manageability, since full permeability would create a potentially bewildering complexity. An example from the "cut" part of the CMT division, was that it was only allowed to source fabric internally from certain locations. 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 all of their capacity freely. As an executive from the capacity planning division put it, "we need someone to oversee the entire value chain."

The third type of concern was one that we expected to be much more commonplace than it was. This was related to supplying competitors with strategically critical inputs, or disrupting relationships with downstream clients. In terms of the former, this was something we had asked about in relation to a number of inputs that Fashion Inc. had already decided to sell to its downstream competitors. Simply put: By offering potentially valuable, differentiated fabric to competitors while it could use it itself, was it not unwittingly hurting its own downstream units? Why sell to a competitor? In most cases, the feeling was that any risk of additional competition from the downstream units of competitors could be offset by the benefits to be had from exposing each part of the value chain to competition, and also by providing opportunities to the upstream segments to grow and prosper, without being constrained by any potential downstream weaknesses. Given the relative stickiness, of sales forces and brand-names for instance, Fashion Inc, executives considered that a new fabric would only sell well if they managed to make it go beyond their own downstream operations; the cost of foregone sales of fabric was thought to be higher than that of lost competitive edge in its own downstream units. Similarly, when we asked why competitors would accept using Fashion Inc.'s fabric rather than their own, we were told that downstream users were mostly interested in what would make the collection sell. Overall, then, it appeared that there was no particular *strategic input concern* – and our understanding was that this was partly due to the limited appropriability concerns. That is, Fashion Inc. was not afraid that selling fabric would dent its own competitive edge in Fabric.

That being said, there were some few (albeit rare) occasions when Fashion Inc. chose not to provide inputs to its competitors. In such cases, Fashion Inc's concern was that it might facilitate a competitor that *had an equally vertically permeable vertical structure*. We were quite surprised to hear that Fashion Inc's concern was not the competition at any one point of the value chain, but rather the existence of firms with equally flexible boundaries, which could also offer their services as "solutions." For such firms, Fashion

Inc. tried not to provide inputs or services that would have allowed them to copy Fashion Inc.'s business ideas and participate in appreciating and exploiting an opportunity.

All in all, then, our analysis of the industry and the product conditions point to a number of potentially important boundary conditions. (Although, at this stage, we can also speculate on their relative importance; further research, in different settings, will be needed to confirm what are the precise factors that make such structures possible and desirable.) Through looking at factors that impeded vertical permeability, we also point to some potential concerns. Yet, notwithstanding these concerns, we feel that the solution chosen by Fashion Inc., and its associated logic, can help extend our understanding, and also develop a conceptual understanding of both causes and consequences of reconfigurability. We turn to this next.

The Framework: Antecedents, Implications and Boundary Conditions of Vertical Reconfigurability

With the evidence in place, we can now summarize our findings by articulating our inductive framework, which helps us to understand what enables a vertically permeable structure to come about; what are its strategic advantages; and what are the boundary conditions, i.e. the limitations to this otherwise powerful means of strategic renewal. Figures 7, 8 and 9 illustrate our framework.

1) Antecedents: BPR and Architectural IT

First, our evidence suggests that to adopt a vertically permeable structure, firms need to undertake substantial process redesign, and to obtain complementary capabilities in the ability to “sell” (or even buy) along different parts of the value chain. Shifting from an integrated mode to a vertically modular one is not just a matter of continually switching between “make” and “buy”; neither is the shift from “source in-house” to “source outside” something that can be executed readily. Organizations need to change their structures in order to be able to interface with markets. And one of the important preconditions for this to happen is the creation of an IT infrastructure that will allow for a vertically permeable structure. In this regard, we found that by far the most important factor was the *architectural IT*, which constrained the firm and circumscribed what could and could not be done. IT, we found, affected the varieties of “organizational and process grammar” (Pentland, 2003) that could be accepted in the organization. This also means that opening up a firms’ boundaries requires substantial intra-organizational change.

2) Implications: Vertical Reconfigurability and Strategic Renewal

Inasmuch as a firm manages to create such a reconfigurable structure, it can expect three types of strategic benefits. First, the firm is able to have a greater degree of responsiveness, as the structure allows

to rapid response to dynamic market opportunities. Second, the provision of vertically specialized services provides a potentially valuable addition to the gamut of offers, and helps segment the market. Relatedly, the presence along many different parts of the value adding process can be used as a way in to wider sales of products and services, and the creation of highly tailored, idiosyncratic packages. And third, it is this very reconfigurability that allows an organization to morph itself into a “solutions provider,” thus substantially softening the competition even in commoditized settings, where the ability to react quickly provides the competitive edge. Thus, a firm can offer advanced product and service configurations that eventually allow it to transform a hyper-competitive environment into a much safer haven, with a higher degree of customer dependency¹⁰.

Insert Figure 8 about here

Boundary Conditions for Vertical Permeability: A Partial List

Finally, if we consider vertical permeability as a potentially important tool for strategic renewal, we must also consider its limitations – the necessary organizational and environmental preconditions that make it a plausible, palatable, and potentially valuable option. As Figure 9 suggests, for a vertically permeable solution to be effective, first, it is important that a focused advantage along the value chain is not only interesting to potential clients, but also maps onto an existing vertical sub-market. Inasmuch as a potential service or product is difficult for the sellers to understand and price, then it becomes difficult to engage in vertically specialized “trade.” Thus, a well-delineated vertical structure in a sector helps to support a permeable architecture. Likewise, existing product interfaces are important in facilitating trade; while Fashion Inc. could bet on its ability to create new and/or unique *bundles* of goods and services, the underlying *constituent parts* needed to be well understood. Furthermore, for this vertically permeable structure to work, there must be both a pool of willing participants in the permeable structure, and, more important, it must not be strategically detrimental for the firm to provide supplies to potential downstream customers who also compete. We speculate that this is a function of the degree of appropriability in the sector. Another aspect is the ability to address a broader set of market needs and requests, since this modular structure can capitalize not only on its own strengths, but also on the capabilities and capacities of other organizations that are brought in. Then, should all of these conditions hold, the firm must also disaggregate its processes, as well as the administrative partitions along its value-adding process, and install the appropriate, flexible architecture that will allow it to become more reconfigurable; in other words, it must undertake a substantial amount of investment in redesign and change – and IT.

¹⁰ Note that these strategic benefits complement and extend the recent analysis in Jacobides & Billinger (2006) on vertically reconfigurable packages, which focuses on the *organizational* benefits from interfacing more freely with markets along the value chain.

Insert Figure 9 about here

Discussion

Our paper has looked at a relatively novel question, and drawn on a number of different sub-fields, many of them connected, even if indirectly. Thus, our findings speak to a variety of literatures relating to boundary design, modularity, IT and strategic renewal. Below we provide some implications for each of these bodies of knowledge.

Building vertically permeable structures: How does this happen?

By looking at what allows for vertically permeable structures to come about, our research highlights the importance and promise of identifying the constituent business processes in the organization. It also suggests that boundary redesign requires a major BPR effort, as the opening up of boundaries entails major “pain” within the organization and is not a simple “switching”. Our evidence suggests that this is particularly true in that re-drawing firm boundaries is a time-consuming process. We found that BPR was as important as legal structures in shaping boundaries. This suggests that the research emphasis on legal changes may need to consider the granular mechanisms to better understand boundaries. Also, by illustrating the extremely taxing process of organizational and IT redesign needed for the boundaries of a firm to change, we infuse some realism into the sketchy discussion of “choosing” between firms and markets, and reveal the organizational underbelly of how scope is chosen. Likewise, our detailed analysis of how firms, through capability bundles, choose their vertical scope, provides a more realistic depiction of what firm boundaries are, and highlights that re-configurability makes the vertical scope of a firm a dynamically (and in some cases even a drastically) changing measure.

Our findings show how firms can reinvent themselves and strategize through boundary redesign, with the help of intelligent BPR and IT design. Our analysis of why firms *process* changes are needed for boundary re-design highlights the role of “process grammar” within organizations (Salancik & Leblebici, 1988). Our findings support the results of earlier research on organizational grammar; in particular, process and supply chain grammar (Pentland, 1994, 1995) and its sequential variety (Pentland, 2003) and temporal structuring (Orlikowski & Yates, 2002). We find that re-configurability of capability bundles can lead to strategic flexibility (Sanchez, 1995; Worren et al., 2002) and allow a more flexible use and coordination of resources within a firm, and also most importantly, *within and between units*¹¹.

¹¹ We have also seen that the role of re-configurability is critical, as it both shapes firm boundaries and enables modular structures to be used effectively. Re-configurability requires architectural IT which becomes the “digital backbone” of the organization. However, our evidence also suggests that the power of modularity is limited by the extent to which modular structures remain reconfigurable when decomposed (see also MacDuffie, 2006);

How Strategic Boundary design can lead to Strategic Renewal: Beyond Transactions and Economizing

Moving from analysis of the preconditions of permeability to its strategic benefits, and its ability to bring about strategic renewal, our study provides a subtler, more dynamic view of scope, and suggests that any firm can adapt its scope – even in “real time,” with the help of ERP network functionalities. This suggests that we need to update our theory, and even more so, our measures of scope, and also consider the role of re-configurability as a new aspect that better explains “hybrid modes” (Bradach, 1997; Foss, 2003).

Our explicit focus on the *strategic benefits* of boundary design also helps to extend work on the boundaries of the firm. It does so first, by shifting attention from individual boundary choices to the logic of boundary design. And second, by shifting from *economizing*, to *strategizing*, i.e. by allowing for factors that have little to do with achieving the most “cost-effective” solution, and much more to exploiting market opportunities and the ability to create market imperfections. Our findings suggest that firms care about maximizing their position, and that the identification of the least “costly” transactional arrangements take the back seat to the identification of attractive opportunities. In other words, a “*strategizing*” focus yields different perspectives from an “*economizing*” one (see Williamson, 1999). More concretely, we show how firms, rather than simply aligning themselves to their transactional environment, use strategic boundary design to cement their positioning and leverage their capabilities throughout the value chain; identify new, higher value-adding vertically specialized services and offerings; and shift their focus from products (that face inevitable competitive pressures), to *services*, with the edge being the ability to provide more tailored support.

This approach provides a substantively and substantially different vantage point from that offered by TCE and other existing research, which focus on “economizing” and the effective choices at the level of a specific transaction. Our approach suggests that to understand the choices in terms of a firms’ boundary design we have to compare the potential strategic desirability of these layouts. It shows how and why choosing *reconfigurable capability bundles*, where scope is adapted in a dynamic way, can lead to strategic benefits that transcend the individual transaction. Thus, our analysis complements recent research on the *organizational* benefits of firm boundaries that accrue to the entire organization (cf. Jacobides & Billinger, 2006), focusing instead on their strategic rationale.

Broader Implications: The changing nature of markets

particularly so when interfaces between *several* modular structures are compatible and offer *multiple* ways of reconfiguration. In other words, we observe that *decomposability* is most beneficial when *recomposability* meets *re-configurability*.

Our findings are suggestive of some broader changes – as they document changes in the ways firms interact with markets. In particular, our findings may incite us to revisit our conception of markets. Our evidence suggests that far from being a locus of homogeneous exchange (White, 1981), markets are becoming collections of potentially customizable, unique exchanges, in which firms try to segregate market niches. We also see firms that try to challenge the existing conceptions of markets, without any penalties for their “social deviance,” *actively transforming* product markets into service markets, or *passively reacting* to changing market opportunities that ask for more advanced offerings.

So, through the usage of granular modular structures and state-of-the-art IT, firms try to segregate market niches in which they strategize and secure sustainable advantages. While each of the constituent parts of the bundles of goods and services provided may be understood, we appear to be heading towards a greater degree of differentiation and customization. This allows us to put in theoretical perspective the managerial discussions on the role of the “shift from products to services” and of the increased role of support and service provision. This shows that firms can use IT-enabled process architectures to shape market offerings and transform “simple” markets (i.e. tee-shirts) into “advanced” markets (i.e. service offerings), and thereby segregate market niches with less competition. In so doing, they also change the way firms interact; they affect the nature, cohesion, and homogeneity of markets themselves.

Tools to explain and account for boundary design, for outsourcers and outsourcees alike

Our this analysis also helps us consider that even in challenging industrial markets, firms can use strategic boundary design to energize themselves and fend off competitive pressures. It is also important that our empirical analysis, and the theoretical framing, does not focus only on boundary design for the final, downstream producer. We thus help redress the very strong implicit bias of viewing the issue of firm boundary design from the perspective of the final goods producer that needs to decide how far back it should be integrated, or how it should control its supply chain. Instead, our focus on an outsourcee allows us to consider how boundary design might work for the firm that undertakes the collaboration with downstream producers. It thus helps “open up” the black box of “outsourcing,” highlighting the role of flexible firm boundary design; and it helps explain how “outsourcees” change the nature of a value system, and use principles of strategic boundary design to renew themselves and their sector.

Our research thus operationalizes and extends modularity research, by focusing on how an organization can use a quasi-modular design for *one given sector*. Rather than focusing on how firms can “patch” or create new units drawing on different capabilities for new ventures – especially in dynamic and emerging markets (Eisenhardt & Brown, 1999; Galunic & Eisenhardt, 2001; Karim, 2006) — we consider how firms are able to re-organize offerings within one given, relatively stable value chain. By taking such a

simple approach, we are able to go into it in greater depth, providing more detailed micro-evidence on *both* the strategic rationale *and* the organizational preconditions for such dynamically flexible structures.

Limitations and Concluding Remarks

Of course, this study has a number of limitations, some of which relate to the choice of setting. First, our analysis concerns a mature market with limited growth potential, a well-established product architecture, as well as rather standardized products with clearly delineated interfaces between the production steps and firms. And while we tried to identify the boundary conditions of our study, our efforts are only initial steps and require supplementary studies.

Yet for all the limitations of an industry case-study, the take-aways should not be missed. This study was based on the understanding of the “process” (see Mohr, 1982); that is, we focused in understanding *the logic through which boundaries were set, the nature of the benefits that emerged, and the issues with making this work*. The inferential basis for this study is not the representativeness of the setting; quite the opposite. It is rather the understanding of the factors that make such a structure possible, and the identity of the benefits, when benefits arise.

We thus hope that this fresh approach will lead to follow-on research. We feel that studying the principles through which firms design their boundaries is very promising, and that it is still in its infancy. Yet the world around us is changing fast - faster than many of the established theoretical trajectories are adapting their focus. If we are to understand the new, technologically-supported structures, and if we are to make headway in understanding the bewildering variety and subtlety in terms of firm boundaries, their antecedents and implications, we will need additional empirically-driven research. We hope that such research, which will hopefully complement, qualify, and extend this paper, will come from a variety of sectors and settings. We think that to be successful, such research should be committed to focusing primarily on the emerging phenomena, while using theory as a lens to understand and explain complex strategic dynamics. In the quest to understand strategic renewal, we may also need to renew our theoretical framing and constructs, allowing empirical reality to provide us a guiding hand.

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Figure 1: The Apparel Value Chain and Fashion Inc.'s new Corporate Structure

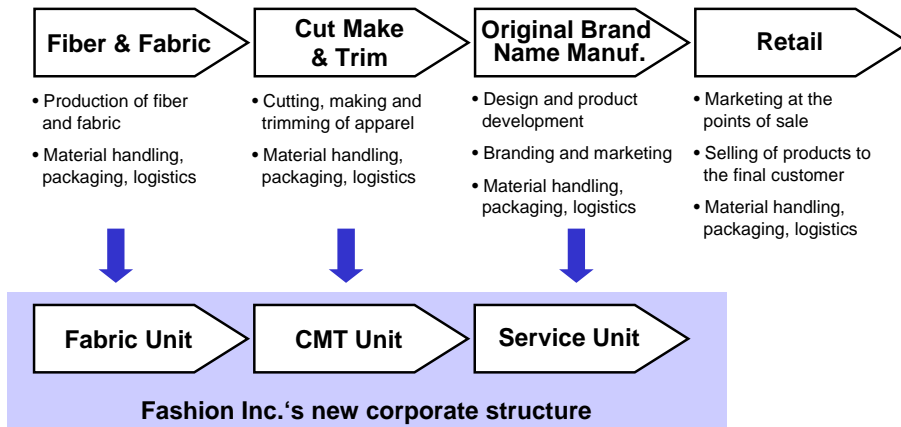


Figure 2: Fashion New Permeable Value Chain

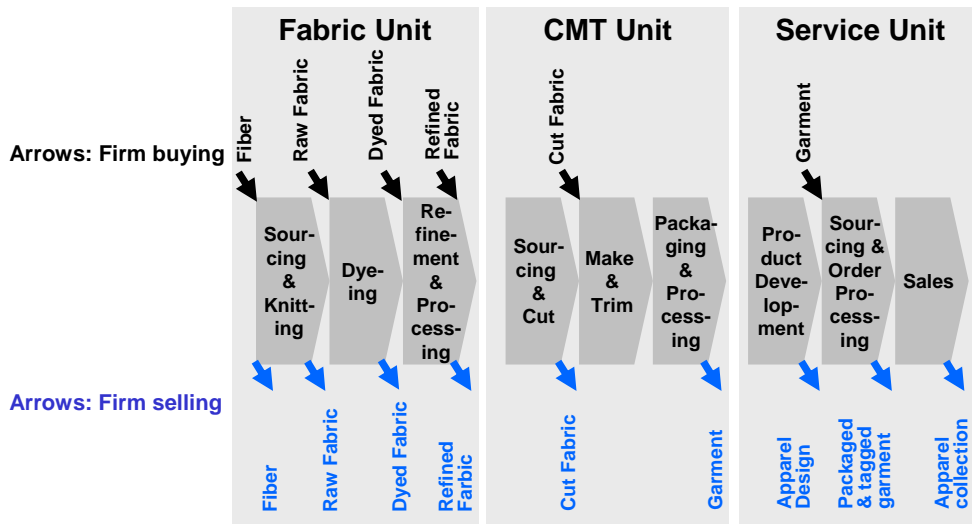


Figure 3: Capability bundles: Examples from the Fabric Unit

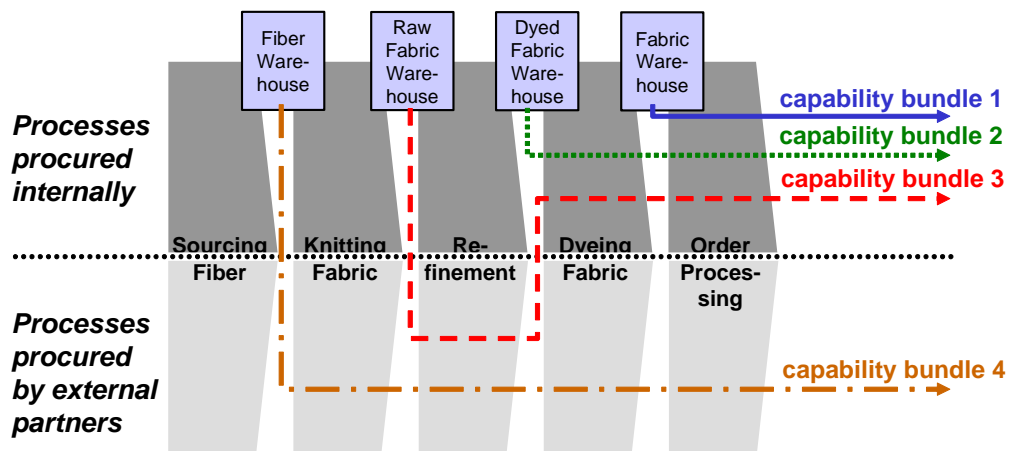


Figure 4: Example for the order management process before redesign. *Left hand-side process: regular apparel customers; Right hand-side process: customers asking for manufacturing capacities*

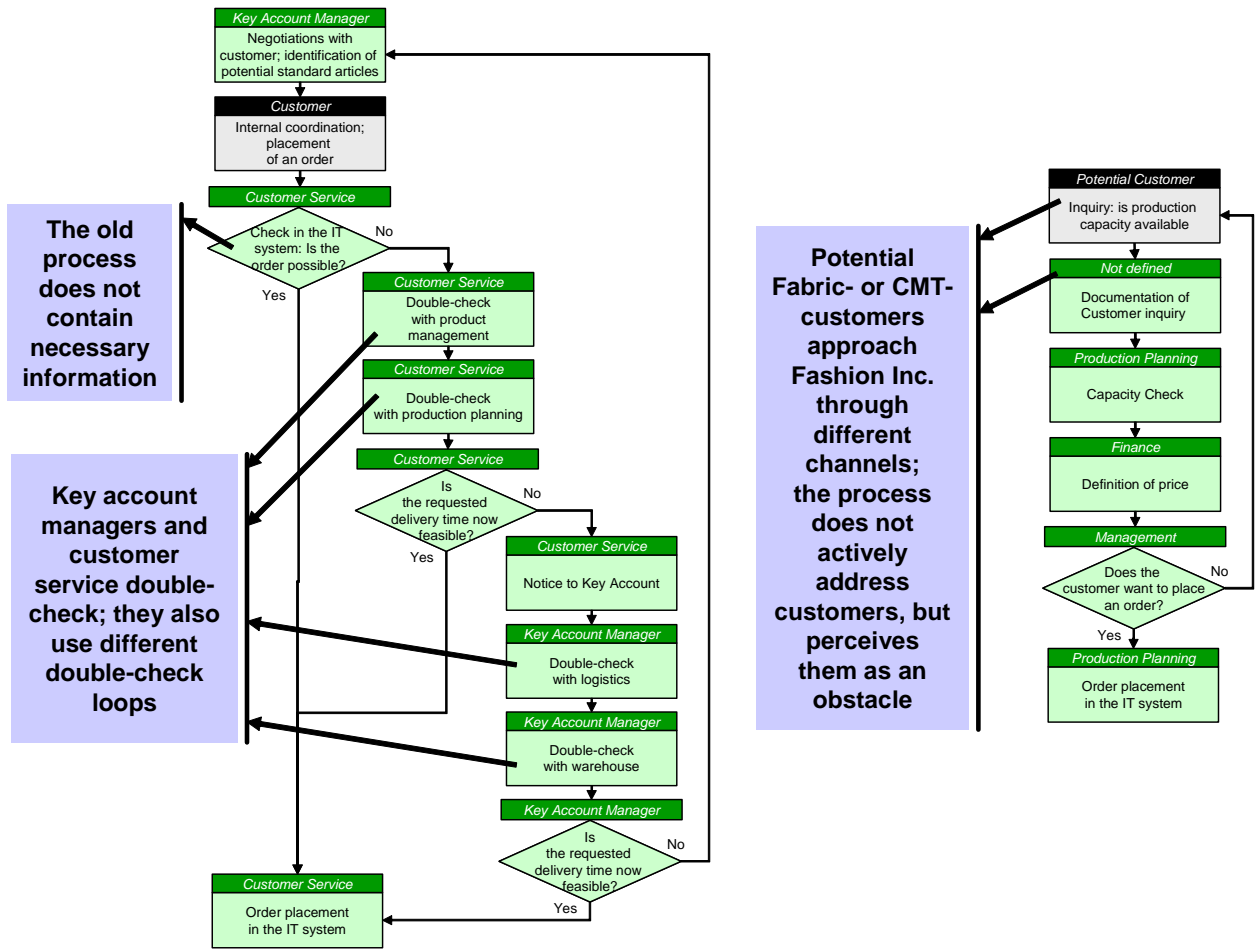


Figure 5: The generic order management process after process redesign; now applied in all SBUs

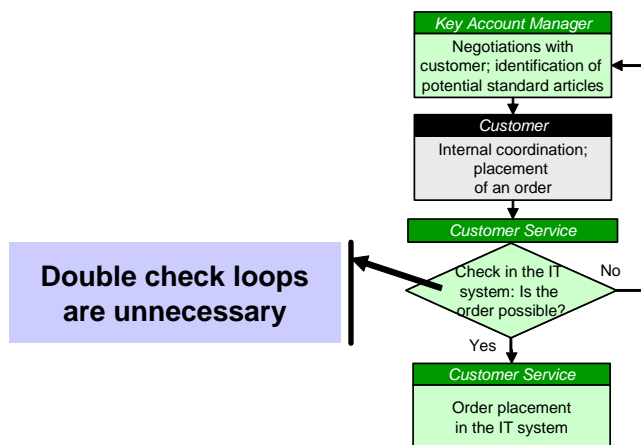


Figure 6: Fashion Inc.'s overall process architecture

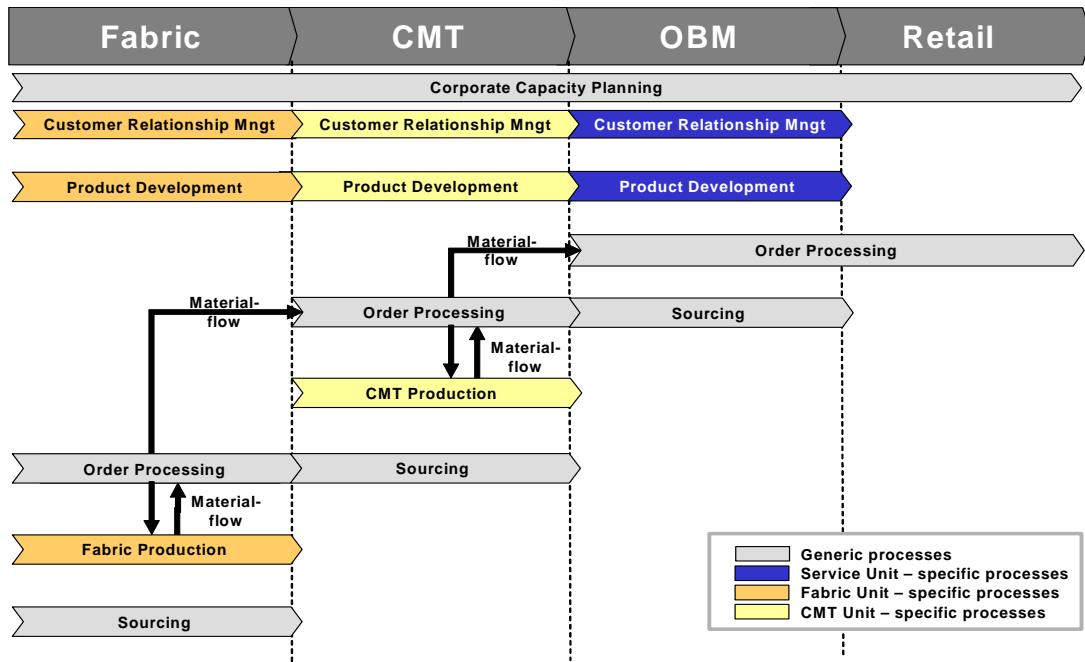


Figure 7: How firms implement a vertically permeable structure

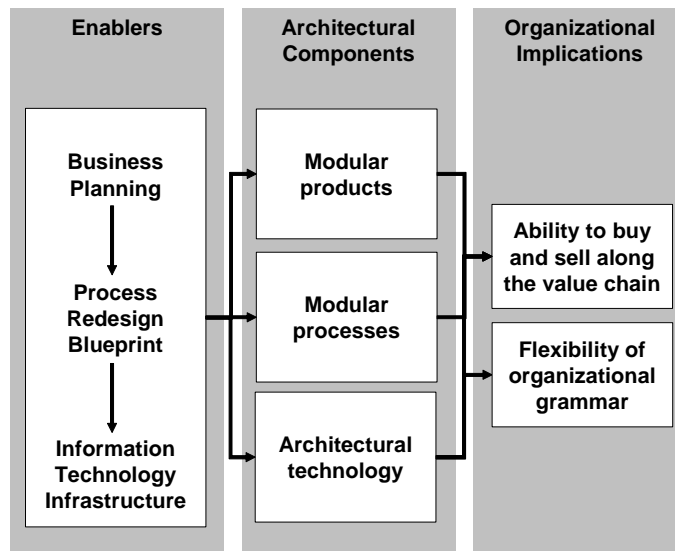


Figure 8: Strategic Renewal through Firm Boundary Design and Re-configurability

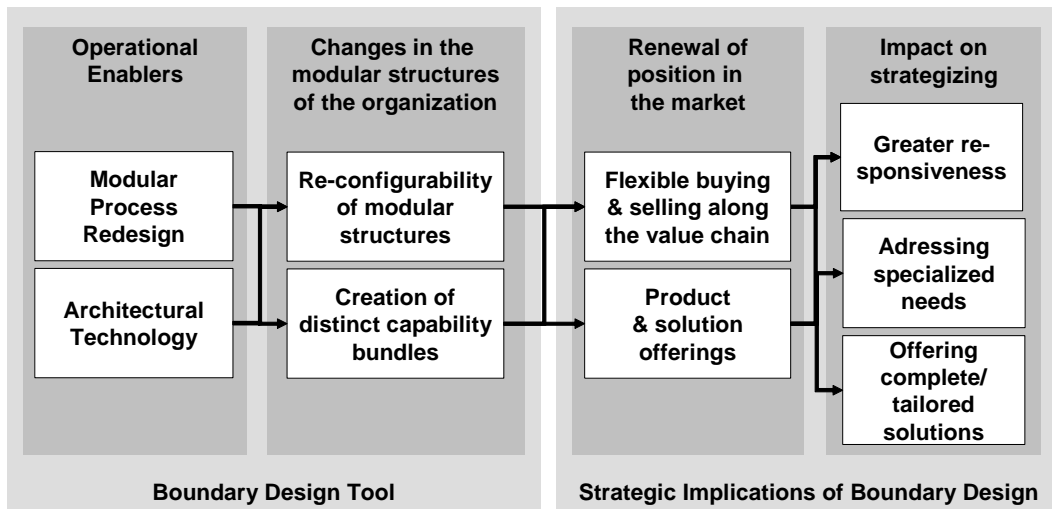


Figure 9: What allows permeable structures to emerge?

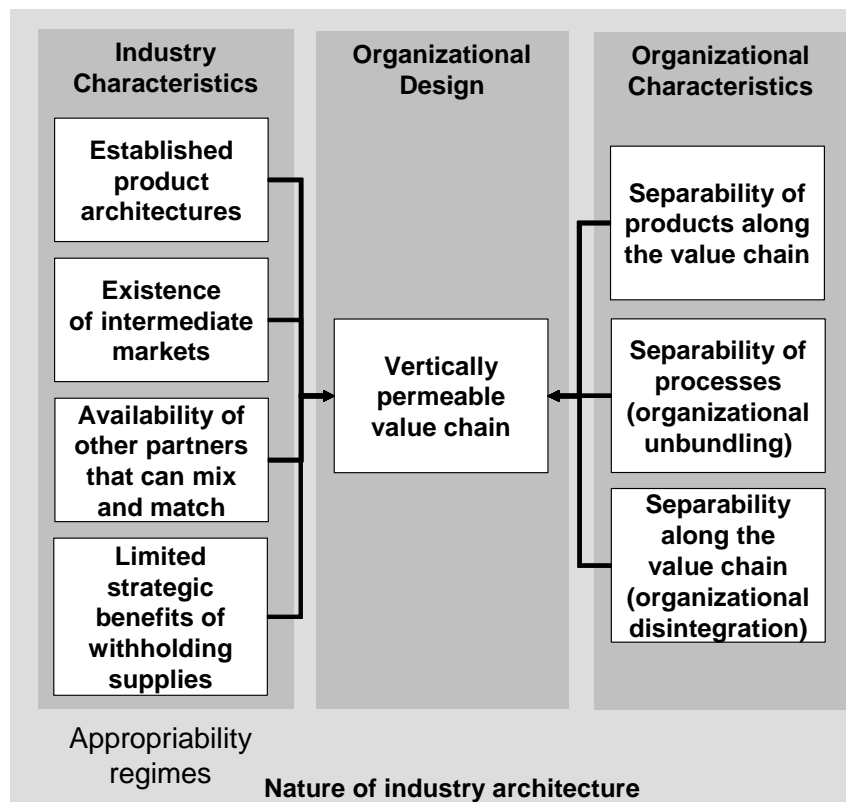


Table 1: Sources of Evidence throughout the Project

Sources of Evidence in each stage of the Project	Stage 1: June 2002 – January 2003	Stage 2: January 2003 – February 2004	Stage 3: February 2004 – May 2006
Primary Sources of Data	<ul style="list-style-type: none"> • Workshop participation, workshop documentation (i.e. handouts, workshop transcripts, working documents, process maps) • Project management documentation • Personal research notes • Internal documents • SBU business plans • Ongoing discussions with project management team, as described in Table 2; initial discussion and framing 	<ul style="list-style-type: none"> • Workshop participation, workshop documentation (i.e. handouts, workshop transcripts, working documents, process maps) • Documentation for IT requirements • Project management documentation • Internal documents • Personal research notes • Employee survey • Ongoing discussions with project management team, as described in Table 2 	<ul style="list-style-type: none"> • Workshop participation, workshop documentation (i.e. handouts, workshop transcripts, working documents, process maps) • Internal documents • Personal research notes • Project management documentation • IT-design documents • Ongoing discussions with project management team (see Table 2) • Semi-structured interviews to confirm theory-building, described in Table 2
Secondary Sources of Data	<ul style="list-style-type: none"> • Historical studies of Fashion Inc. • Sector descriptions • Research papers with apparel focus • Analyst reports 	<ul style="list-style-type: none"> • Sector descriptions • Press releases • IT-manuals • Company manuals 	<ul style="list-style-type: none"> • Sector descriptions • Press releases • IT-manuals • Company manuals
Company Events involved in	<ul style="list-style-type: none"> • Workshops as described in Table 2 • Firm-wide gatherings (1 presentation of the new collection, firm anniversary, 2 firm parties) 	<ul style="list-style-type: none"> • Workshops as described in Table 2 • Firm-wide gatherings (1 presentation of the new collection, 2 firm parties) 	<ul style="list-style-type: none"> • Workshops, as described in Table 2 • Firm-wide gatherings (1 presentation of the new collection, 1 firm party)

Table 2: Workshops Involved in / Attended during the Project, per Objective and List of Interviews, Meetings

Type of workshop - dates	Number of participants	Number of meetings	Main objective of workshops	Demographics of workshop participants
<p><i>June 2002 to January 2003</i> Weaknesses in the former processes in 2002</p> <ul style="list-style-type: none"> • Research and Development • Sourcing and Order Processing • Customer Relationship Management • Production (in 4 different countries) 	<p>205</p> <p>40</p> <p>55</p> <p>20</p> <p>90</p>	<p>8</p> <p>1</p> <p>2</p> <p>1</p> <p>4</p>	<ul style="list-style-type: none"> • Identification of operational weaknesses and required IT functionalities • Brainstorming on possible improvements 	<ul style="list-style-type: none"> • Employees and middle management; including all key persons of operations • 50% of which were more than 10 years with Fashion Inc.; 25% between 5 and 10 years; 25% less than 5 years
<p><i>October 2002 to January 2003</i> Strategy</p> <ul style="list-style-type: none"> • Market Analysis (ECR & PARTS) • Processes (Process & Portfolio) • Development (SEP, Evaluation, consol.) • Implementation (2 x BSC, Sourcing) • Quality & Review 	<p>75</p> <p>10</p> <p>10</p> <p>10</p> <p>15</p> <p>15</p>	<p>14</p> <p>2</p> <p>2</p> <p>3</p> <p>3</p> <p>4</p>	<ul style="list-style-type: none"> • Translation of SBU business plans into operations • Strategic framing for process redesign 	<ul style="list-style-type: none"> • Top management • Representatives of the re-engineering team • 30% of which were more than 5 years with Fashion Inc. • 70% of which were less than 5 years with Fashion Inc.
<p><i>January 2003 to December 2004</i> Process Redesign and Implementation</p> <ul style="list-style-type: none"> • Research and Development • Sourcing and Order Processing • Customer Relationship Management 	<p>43</p> <p>20</p> <p>20</p> <p>3</p>	<p>65</p> <p>25</p> <p>35</p> <p>5</p>	<ul style="list-style-type: none"> • Design and implementation of future processes with optimized interfaces • Identification of SBU-specific and generic processes 	<ul style="list-style-type: none"> • Middle management and motivated key persons of operations • 95% of which were at least 5 years with Fashion Inc.
<p><i>October 2003 to February 2004</i> Selection of ERP system</p>	<p>15</p>	<p>3</p>	<ul style="list-style-type: none"> • Design of IT prototypes • Selection of future IT 	<ul style="list-style-type: none"> • Middle management and motivated key persons of operations • 95% of which were at least 5 years with Fashion Inc.
<p><i>June 2002 to May 2006</i> Regular Milestone & Project Meetings</p> <ul style="list-style-type: none"> • Project review meetings & discussions <p>Interviews (Fashion Inc. * and IT consultants **)</p> <ul style="list-style-type: none"> • General setting * • IT infrastructure **/** • ERP and MSP / SCP systems ** • Verification of research results **/** 	<p>2-10</p> <p>25</p>	<p>108</p> <p>35</p> <p>7</p> <p>12</p> <p>10</p> <p>6</p>	<ul style="list-style-type: none"> • Project management of the change project • Verification of research layout, tentative and final findings 	<ul style="list-style-type: none"> • 30% more than 20 years with Fashion Inc. • 40% more than 10 years with Fashion Inc. • 30% less than 2 years with Fashion Inc. • IT consultants: more than 5 years in IT

Table 3: Inter-unit cross- and up-selling along Fashion Inc.'s value chain

Category	Typical products of the 'traditional' market (examples)	Inter-unit cross-selling and up-selling (examples)
Fabric Unit	<ul style="list-style-type: none"> • Raw Fabric • Refined Fabric 	<ul style="list-style-type: none"> • CMT manufacturing • Garment Design (Service Unit)
CMT Unit	<ul style="list-style-type: none"> • Garment 	<ul style="list-style-type: none"> • Fabric R&D • Garment Design (Service Unit)
Service Unit	<ul style="list-style-type: none"> • Apparel collection 	<ul style="list-style-type: none"> • Fabric R&D • Fabric / CMT manufacturing