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BUSINESS MODEL INNOVATION IN A TRANSFORMING COMMODITY INDUSTRY: THE CASE OF A CANADIAN LUMBER REMANUFACTURER

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Business Model Innovation in a Transforming Commodity Industry: The Case of a Canadian Lumber Remanufacturer

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Abstract

This paper presents business model innovation in a traditional push-focused commodity enterprise, seeking to become a customer centric network organization in echo to wider industry trends and imperatives. The Tetrahedral business design framework is used to holistically represent the firm and the industry in which it does business through four poles: Character, Creation, Offer and Stakeholders and their various interrelationships (Caisse & Montreuil, 2006). The case under study is a lumber remanufacturer which re-cuts lengths of original timber coming from sawmills in such a way as to produce original lumber whose calibre meets the saw timber industry's qualification standards. The enterprise is seeking to re-center its design on better serving a specific type of clients through value-added offers in a bid to emancipate itself from the lumber commodity crisis felt in the Quebec industry at the time of the study (Coulombe, 2004). The paper is structured as follows: the Tetrahedron is presented first, followed by the designs of both industry and business. Business model innovation as a dialectic relationship between industry and business designs is discussed. The paper concludes with major takeaways and venues for future research.

Keywords

Business Design, Business Models, Lumber Industry, Innovation, Business Model Innovation

Note

This paper was presented at EBRF 2007 - Research Forum to Understand Business in Knowledge Society, held in Jyväskylä, Finland, September 25 -27. Conference proceedings are available at www.ebrf.fi

Introduction

This paper presents the design of Quebec's lumber industry and the design of a lumber remanufacturer doing business within this industry. These two analyses, done through the same conceptual business design framework, serve to present business model innovation as a process of system-to-system dialectic, where at least one system seeks to substantially alter the dialectic.

Quebec is a province of Canada, where the provincial government owns most of the boreal forest, a vast expense as big as Sweden and Norway combined. The lumber industry has been vital to Quebec's economic vitality for centuries, and its recent troubles have made for frequent headlines in most provincial newspapers: increased competition from abroad; increasingly unfavourable exchange rates; massive layoffs for sawmill workers; and whole regional economies threatened by these changes, where lumber is a key economic resource. The industry case here studied is limited to lumber and its use as dimension or engineered wood, as distinct from ligneous fibre used for pulp and paper and lumber by-products like chips used for agglomerates, combustible, etc. It also limits itself to the province of Quebec, which features some unique design characteristics, the main one being public ownership of the forest. The business case presents a lumber remanufacturer which acquires cheap lumber of intermediate grade from sawmills' lumber yards and cuts it into shorter segments yielding higher and intermediate grade pieces of lumber which can be sold for a profit

Section 1 presents business design, its key intellectual contributions, as well as the framework chosen to conceptualize both the sawmill industry and the studied remanufacturing business: the Tetrahedral Business Design Framework (or "Tetrahedron"). Section 2 presents the analysis of the industry's four poles. Section 3 presents the analysis of the business' four poles. Section 4 presents a deeper analysis of the interrelations between the business' four poles and dialectic relationships between industry and business designs. The paper concludes with major takeaways and venues for future research.

1. Tetrahedron: A Conceptual Business Design Framework

Design refers to *purposeful* complexity, either through what is intended to emerge or in what is planned to occur. Business design is rooted in strategic management, but far exceeds it scope. Conceptual business design frameworks seek to provide the conceptual anchors to represent the whole of business, which is to say vast amounts of knowledge, insights and wisdom in systemic, meaningful and tractable fashion (Senge, 1990). Not all business design frameworks are created equal; frameworks vary in granularity, scope, intent, and so forth. A thorough comparative analysis of business design literature's various frameworks is provided by Caisse and Montreuil (2006). Noteworthy frameworks include the Three Dimensions Framework of Slywotsky & Morrison (1998), the e-Commerce Framework of Rayport & Jaworski (2003), the Business Model Framework of Hamel (2000) and the Tetrahedral Business Design Framework of Caisse & Montreuil (2003).

This paper examines Quebec's lumber industry though Caisse & Montreuil's Tetrahedron, which takes root in four basic ideas, portrayed as poles: Character, Creation, Offer and Stakeholder. Since each pole relates to the other three in a precise way, the poles are bridged by links portrayed as pairs of unidirectional flows: Gain, Contribution, Role, Network, Bundling, Feedback, Threat, Defense, Orchestration, Learning, Alignment, and Engagement. The framework is thus composed of four poles linked by twelve flows, geometrically forming a tetrahedron. Character is the collective actor and its praxis. Creation is the process through which past, present and future contributions are transformed into new stakeholder value potential. Offers are what attract individual actors into the business, like products, shares or careers. Stakeholders are the business' individual actors, like clients, employees, investors, suppliers, and etcetera. The overarching concept binding a pair of poles is called a dyad, and that which sums up the relationships between three poles is called a face. Note that flows, faces and dyads exceed the scope of this paper and are not discussed unless necessary in section 3. The designs of both industry and business cases are presented though their respective poles and holistic tetrahedrons, which is enough for the purpose of this research. Figure 1 presents the Tetrahedron and its various conceptual components.

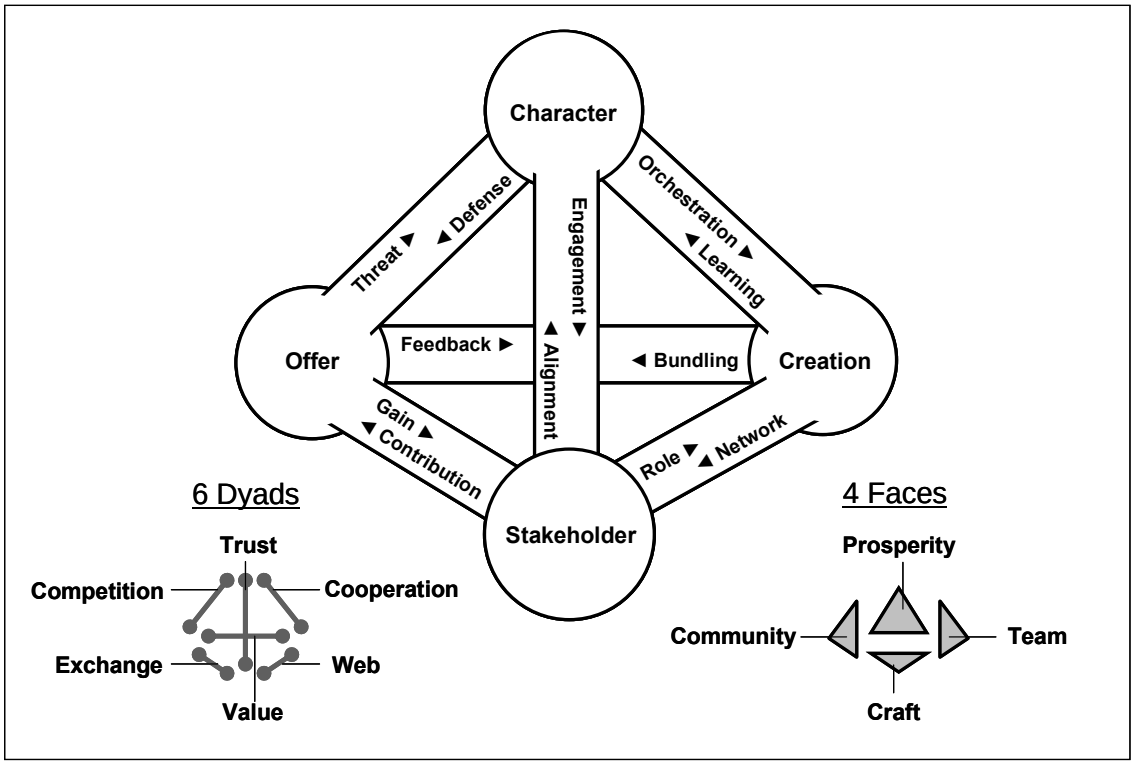


Figure 1. Tetrahedron Business Design Framework

2. Industry Design

The vast majority of Quebec's productive forests are publicly owned, most of which are coniferous and transformed through Timber Supply and Forest Management Agreement (TSFMA). These agreements secure sawmill lumber supplies in exchange of economic rents

and sustainable development obligations. Quebec sawmills get their wood from both private and public forests. As shown in Figure 2, the industry started as a means to covert forests into money. It did so not only for sawmills, but for stakeholders as a whole: government collected economic rents from sawmills, cities were built around shipyards and pulp and paper factories, farmers became lumberjacks for the winter, etc. With a seemingly infinite resource, processes were decidedly oriented downstream and production capacity went up with no ceiling in sight – more capacity equalled more lumber equalled more revenue.

As tools and processes evolved, it became clear that the resource was finite and that making money from the forests would take more than steady growth in transformation capacity. Competition from other provinces and countries pushed lumber into commoditization, with more value-added activities flowing downstream. Other uses for the forests came to vie for economic attention as well. In addition, non-economic uses became new priorities for a number of stakeholders, dislodging economic rents in favour of ecologic rents for some.

The industry can currently be characterized as a mostly U.S.-oriented commodity supplier with sawmills sourced through government TSFMAs, but its position as the preferred means of converting forests into money is strongly questioned. Sawmills want to keep making money from the forest, but they are trying to shift from push-to-market strategy to a market-pulled strategy, improving their tools and processes while starting to compete for downstream added-value activities carried out by their own clients. In addition to vertical integration and downstream migration, horizontal consolidation through mergers, acquisitions and partnerships are deemed inevitable by most.

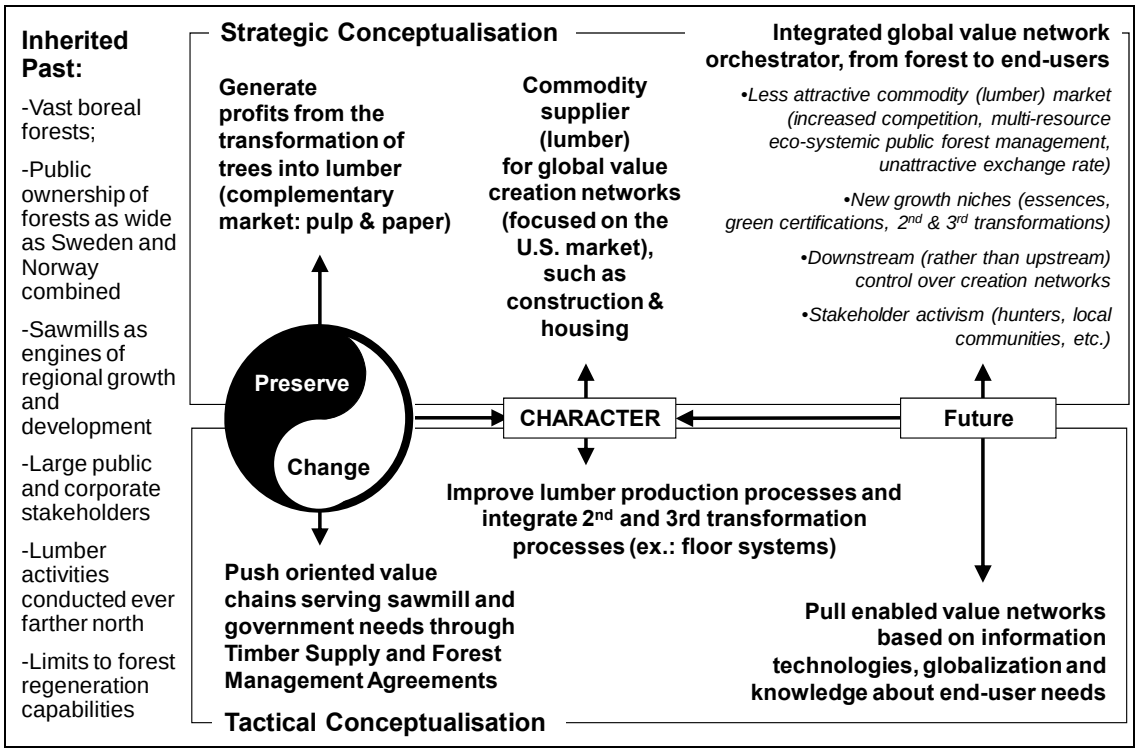


Figure 2. Character of Quebec's lumber industry

Looking forward, public forests become the focus of multi-purpose, ecosystemic management practices, where transforming trees into lumber is just one of many ways of making money from the forests, and where making money is just one of many objectives in forest management. It is within this context that sawmills hope to integrate and lead their value networks worldwide, from forest to end-users, by mastering new technology-enabled pull-oriented processes, fostering a global mindset, and gaining a thorough understanding of end-user needs.

Figure 3 presents the individual actors who make up this industry in three broad groups: lumber manufacturers ("lumberers"), business facilitators ("enablers") and lumber consumers ("clients"). Note that an individual actor may belong to more than one group depending on the offer or creation process considered. Stakeholders increasingly use Internet to present themselves, and the growing use of information technologies to research, analyse and match end-user demand to sawmill capacity is represented as a "@" pulley system in Figure 3.

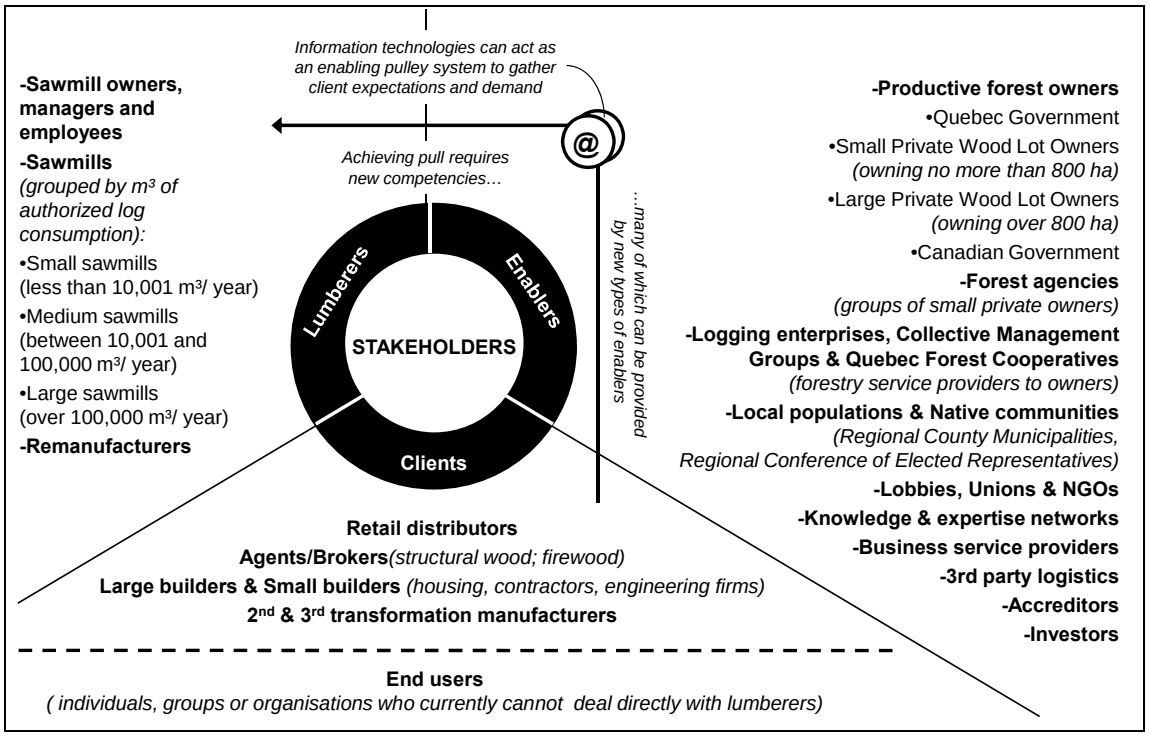


Figure 3. Stakeholders of Quebec's lumber industry

Lumber manufacturers include business owners, managers and employees, large, medium and small sawmills, and remanufacturers. Sawmills can carry out various tasks such as collecting, sawing, classifying, drying and finishing lumber in accordance to various environmental forest management standards. Remanufacturers buy lumber from sawmills and add value through new cuts, grades, packaging, and so forth.

Enablers include forest owners, groups of owners, forestry service providers, local and native populations, lobbies, unions and non governmental organizations, knowledge and expertise

networks, business service providers, 3rd party logistics, accreditors, and investors. The Quebec government is the largest forest owner of productive lands and provides leadership for most other enablers, initiating, funding and coordinating multiple initiatives, such as open industry tools and software, specific training programs, and various efforts aimed at resources valorization, Agencies and cooperatives offer various forestry services to government and private owners. Local populations are represented by regional county municipalities and regional conferences of elected representatives. Lobbies, unions and NGOs abound, notably where the environment is concerned. Knowledge and expertise networks include academia and non-academia experts from various fields. Business service providers include eBusiness solutions suppliers, legal counsel, accounting services and so forth. Third party logistics include overland and overseas transport, as well as complementary services such as just-in-time inventory management. Accreditors are organizations which certify lumber or sawmills for various purposes. Investors include entrepreneurs, bankers, investment funds and various other organizations ready to loan or invest in the industry.

Lumber clients include brokers, retail distributors, builders, 2nd and 3rd transformation manufacturers and end users. Agents and brokers aggregate sawmill offers and lumber client demands, thus acting as information intermediaries in the absence of a commodity exchange to support the lumber trade within Quebec. Some remanufacture lumber which they acquire and stock for later trade. Some online business directories offer information about industry stakeholders, while others act as agents for sawmill networks, locating clients, organizing transport and preparing market studies. Retail distributors usually have warehouses located near urban areas and ports, with retail outlets located closer to consumers. Retail distributors are not the only outlet for sawmills; some may sell directly to builders, given orders ranging in thousands of cubic meters. Builders use lumber and prefabricated systems such as roof trusses, floor systems and wall panels for construction work. They are increasingly interested in prefabricated systems mainly because they require less costly specialized labour in the face of growing expertise scarcity (Schuler & Adair, 2003). In addition, large American builders tend to seek as few suppliers as possible to minimize transaction costs and complexity; such suppliers may supply lumber and prefabricated systems as well as other complementary offers such as windows, doors, plumbing and so forth, making it more attractive to think of distribution channels in terms of intricate webs rather than simple chains. Second and third transformation includes roof trusses, wall panels, flooring systems, doors, windows, patios, fences, pallets, furniture and so forth, many of which are complementary to the housing market.

Figure 4 groups the industry's key offers along stakeholder lines drawn in Figure 2: what the industry offers to lumberers, what it offers to enablers, and what it offers to clients. These broad offer types are subdivided in five strata. At the core are undifferentiated offers – the basics of the trade (commodity lumber, wages to workers, moneys owed to suppliers). Each layer adds a new type of value, which is intended to generate an added gain premium, either in economic or non-economic terms.

One of the key design aspects of Quebec's lumber industry is what it offers to business facilitators in general and the provincial government in particular. At its most basic level, the industry generates economic activity like any other. Unlike other industries, it generates a direct economic rent for the government through TSFMAs: the more wood is cut, the more moneys are collected. As a renewable resource, its preservation represents an investment for

future revenues. Balancing this long-term gain against short term revenues has been the object of much debate (for a recent example, see Coulombe, 2004). Beyond these opportunities for gathering economic rents lies a more potent form of gain for the government: economic development. Forestry creates jobs on scales large enough to warrant the development of remote regions. These political, social and economic gains can be counterbalanced by unsustainable harvesting practices; closing down sawmills and villages where short term gain has overshadowed long term benefits is not good news for the government. The highest form of gain is true transformation for a given region: from basic economic activity to continued prosperity reaped from a renewable resource and its various derivatives.

The industry's past design allowed for the development of remote regions, but fell short of sustaining their prosperity. The fact that the industry's current design cannot reach this level of transformative offers – from momentary wealth to sustained prosperity – is a crucial point. In a nutshell, rising supply costs in getting lumber from ever farther regions in compliance to ecosystemic imperatives which imply the creation and maintenance of road infrastructures is pushing commodity prices up. In addition, rising exchange rates with the USA, the main market on which the commodity focus was enacted, is also pushing commodity prices up. As the commodity offer no longer generates the profits it once did, sawmills start to close down. This, in itself, is not a problem if an industry has alternative jobs to offer in order to sustain the prosperity of a region. Unfortunately, this is not the case of the sawmill industry. As a result, the government, a key stakeholder in the design under review, may turn to other industries which can offer sustained prosperity. This means legislative and executive attention turning away from lumber for forest valorization. In this sense, what the industry offers to end clients is the foundation upon which broader transformative offers can be built.

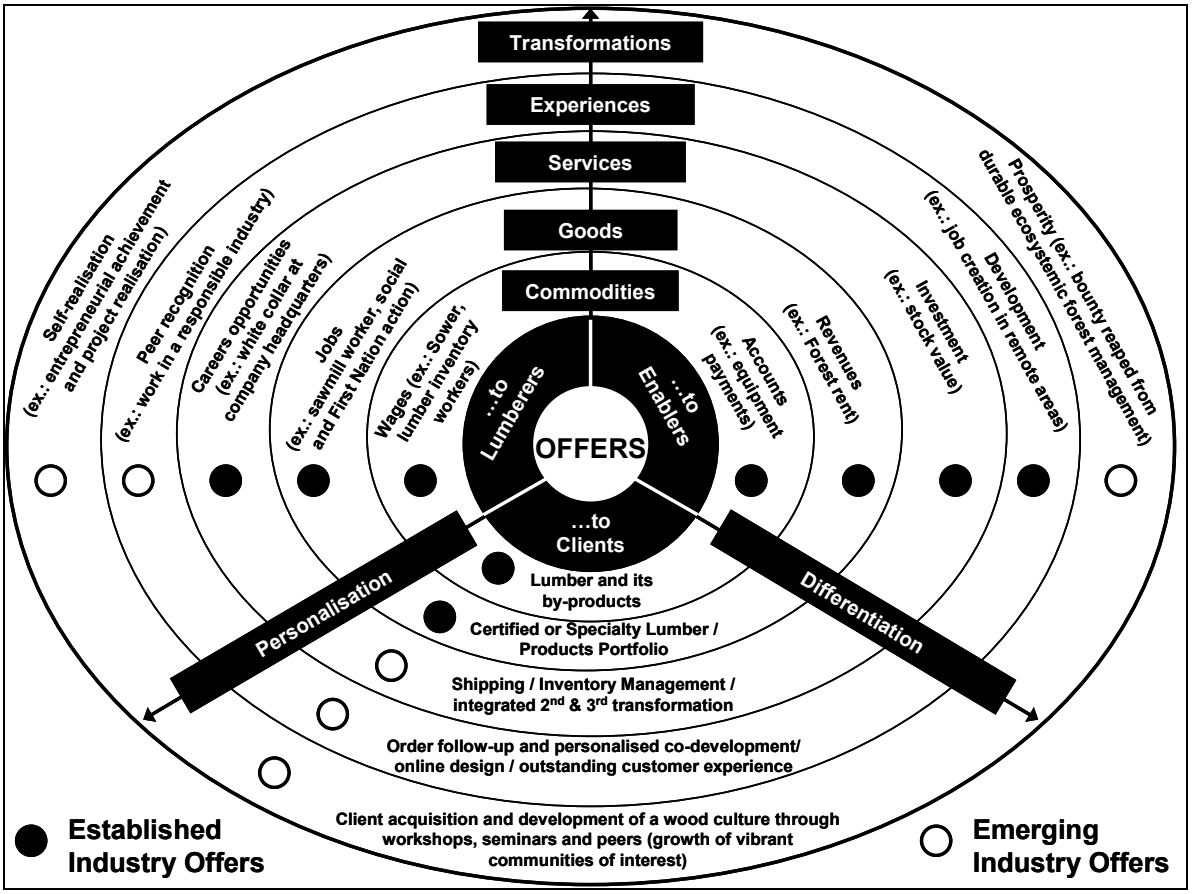


Figure 4. Offers from Quebec's lumber industry

Another crucial design aspect is what the industry offers to lumberers after so much time and energy spent focusing on the US lumber commodity market. The current design provides salaries, jobs and careers characterized by the mastery of rules, guidelines and practices aimed at the delivery of a standard commodity (note that investors are considered to be facilitators rather than transformers). It offers little in terms of peer recognition, and that will likely remain so as long as public perception of the industry remains negative. The number of forestry graduates has been declining for some time and there is no indication that the trend is buckling as of this writing (Coulombe, 2004). Offers of self-realization are even more remote, although some may exist for entrepreneurs.

From the clients' point of view, the industry traditionally offered what it was best at pushing through its value chain: undifferentiated lumber. This commodity offer has been enhanced by modest levels of differentiation, such as certified product or logistic services. The service level is the one receiving the most attention nowadays, as industry majors strive to move from push to pull by using new technologies. On one hand, the Web has so far proven to be a poor platform for the sale of traditional lumber commodities, with most transactions still conducted through phone and fax. B2C and B2B web sales which include e-payment options and shipment details for clients are limited to 2nd and 3rd transformation products like wooden toys and furniture. On the other hand, the Web has proven to be a better interface to prepare a

transaction, most notably in monitoring lumber stock and availability, as well as providing a virtual workspace where businesses can potentially co-develop an offer with its clients (ex.: the online design of a pre-fabricated house, followed by a phone order). Experiential offers which, for example, could enable a family to witness the creation of its chosen prefabricated house, or transformational offers which, for example, could turn end users into advocates of the environmental benefits of lumber usage in housing construction, are still in their infancy.

Figure 5 presents the industry in its wider creation context: the forest considered as a source of ligneous fibre, in abstraction of other uses such as hunting and tourism, is subject to multiple uses such as pulp, chips, panels, lumber and treated logs production. Sawmills transform logs into lumber, which may be further transformed, or used in construction by framers, builders or consumers. This value chain can operate as a push mechanism, or as a feedback pulling interface. Push is increasingly giving way to pull, as companies seek to improve production and sales through intranets and pool their tools such as resource planning and sorting machines in an attempt to plan demand and react more quickly to changes.

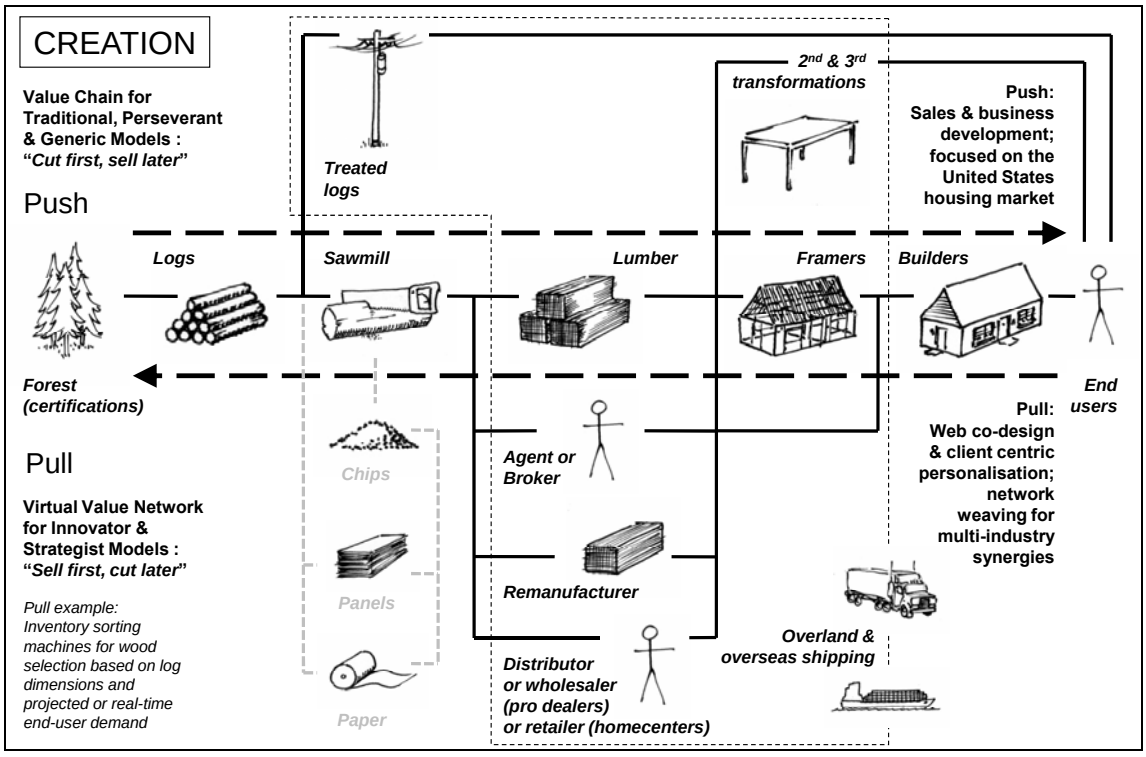


Figure 5. Creation in Quebec's lumber industry

Most sawmills are certified to insure that the wood they transform conforms to environmental standards. Certifications found in Quebec include ISO 14001, FSC, and CSA, which include rules for native population participation in strategic forest management, pristine forest conservation, etc. Sawmills are also certified to insure that the lumber they produce conforms to various qualitative and quantitative measures.

The development of a feedback pulling interface is an essential trait of the industry's envisioned design. For example, builders face increasing worker unavailability, translated into higher wages and longer delays. Prefabricated housing or prefabricated frame components constitute an increasingly attractive proposition, creating new types of demand for lumber: common dimension wood is thus transformed into ready-to-assemble jointed frames, roof trusses, wall panels, etc. These value-added products must then be moved by trucks or ships to their destination – either retail distributors or builders. Most of these value-adding transformations are currently carried out by framers who specialize in pre-fabricated house sub-components such as roof trusses and flooring systems.

The current industry design allows many intermediaries to add value and coexist. Large sawmill groups create lumber and can sell to intermediaries or builders directly. Large sawmills also create specialized lumber, sometimes in direct response to online demands. Wholesalers match sawmill inventory and capacity with downstream demand (some using past data and information systems to anticipate offer and demand), usually by phone or internet. Information intermediaries and brokers communicate lumber and sawmill availability through the Web, potentially at the expense of wholesalers and retailers, though most retailers rely on geographical proximity to reach their clients. Consolidation of capacity for sawmills seems likely, as well as consolidation of offer and demand aggregation for wholesalers, brokers and information intermediaries.

To sum up this industry's design through the Tetrahedron: the Quebec lumber industry is entrusted with a key collective resource capable of bringing wealth to all of its stakeholders, with the Quebec provincial government being one of the most important ones. The industry's creation endeavours are shifting from push to pull dynamics; devising better production and inventory management and achieving shorter delays, using the Web to exchange more meaningful information faster, and connecting key stakeholders in new ways. And its offers are gaining in refinement as it moves from commodities to higher levels of differentiation and personalisation. Nevertheless, few Quebec-based sawmills are yet active in the more complex and value-adding activities.

3. Business Design

The business case under study is a remanufacturing sawmill made up of two distinct corporations: Produits Forestiers Miradas and Miradas Industries. While this divide may be important for financial and legal reasons, both are so intimately tied in terms of design that they are referred together as Miradas. The case study does not extend beyond 2006, as a mean to reduce the competitive risks associated with making the business design available to the public. Accordingly, precise data has been made approximate, so that the business design can be understood in terms of relevant dynamics without having to reveal too much sensitive information.

Miradas is an extension of its founding entrepreneur, President R. Grondin, a charismatic businessman intent on seeing his company grow and prosper. There is thus a will to question what Miradas is and what it may become, as portrayed in Figure 6.

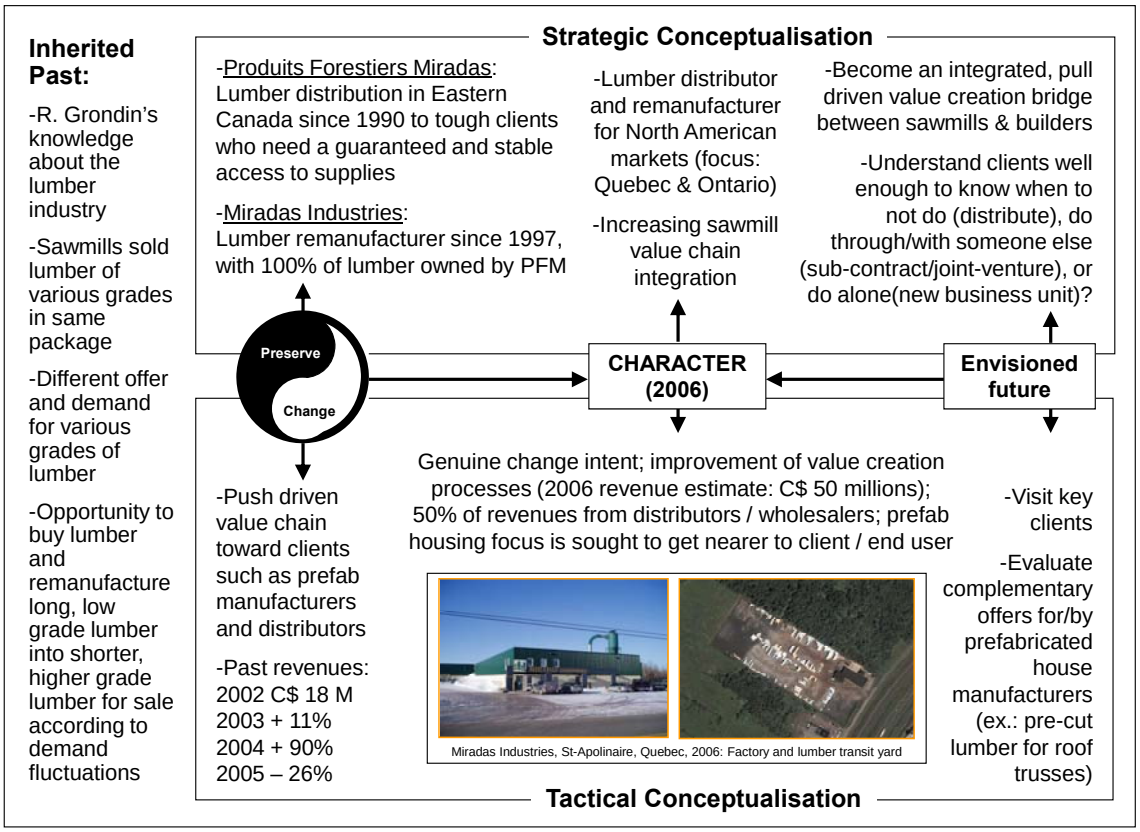


Figure 6. Miradas Character Pole

Inherited Past: Through work as a buyer for one of Quebec's major do-it-yourself renovation retail chains, R. Grondin accumulated knowledge about the industry, its practices and how sawmills offer and client demand influence pricing. Miradas began as an intermediary, buying low cost wood and waiting for the right moment to sell to clients with needs for guaranteed and stable supplies. A key insight was to locate locked value in how sawmills sold their wood: lumber of various grades were often lumped together as commodities and little effort was made to cut lumber according to client grade demand. An opportunity lay in deciphering industry trends and price fluctuations so as to buy cheap, intermediate grade lumber and remanufacture it to shorter lengths, yielding two parts: one at the original's grade and one of higher grade. Also needed was a keen insight on when to sell such remanufactured goods and to whom.

Past Strategic Conceptualization: Produit Forestier Miradas (hereafter PFM) started distributing lumber in Eastern Canada in 1990 to clients who needed guaranteed and stable access to supplies. This was followed in 1997 by Miradas Industries (hereafter MI), which remanufactured PFM's lumber according to demand. Such remanufacturing was done on an exclusive basis for PFM, with all lumber remaining PFM's property.

Past Tactical Instantiation: MI was put in place to unlock value trapped within sawmill lumber, which PFM acquired while playing the market – essentially trying to speculate on offer and demand fluctuations. Miradas was thus acquiring in a push-oriented logic, filling its

lumber transit yard through advantageous upstream deals, remanufacturing some of its inventory, and pushing its goods downstream to clients. Sales rose from C$ 18 M in 2002 by 11% in 2003, 90% in 2004 and fell by 26% in 2005. The drop in sales between 2004 and 2005 reflects a drop in lumber prices rather than a drop in volume, which remained stable from 2004 to 2005.

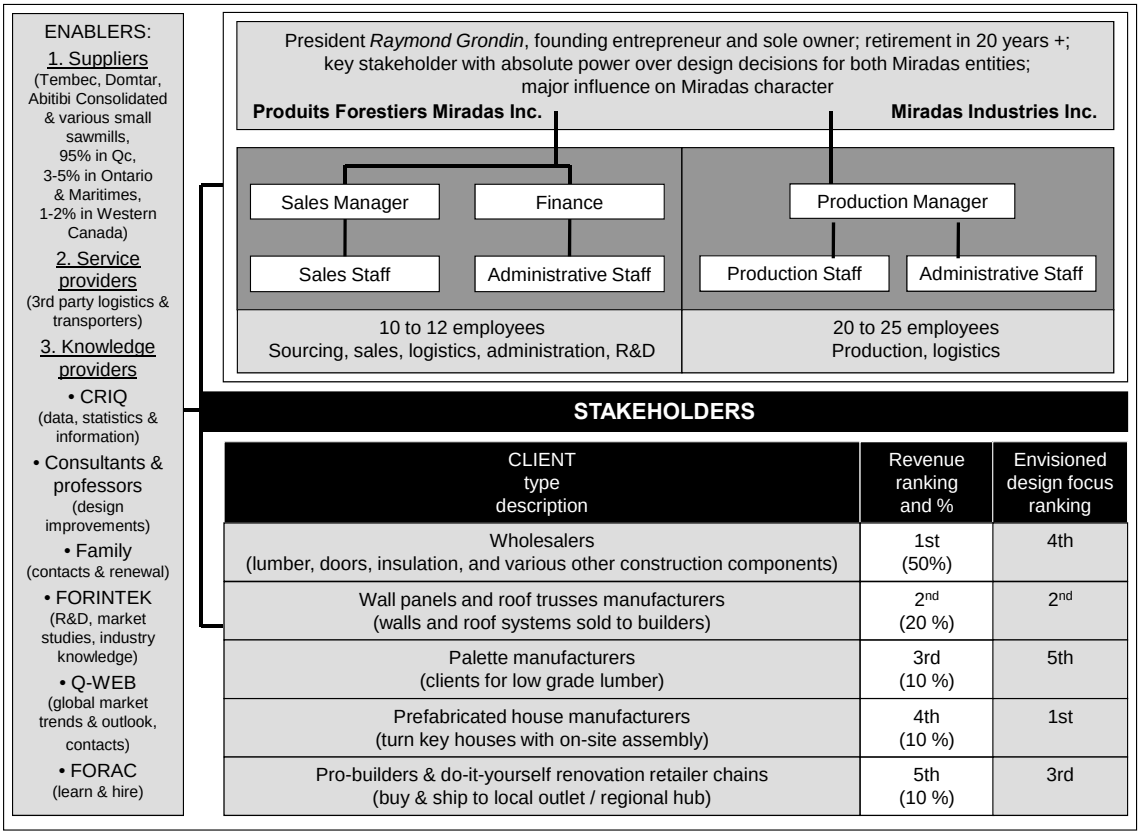
Current Strategic Conceptualization: As of 2006, Miradas is a lumber distributor and re-manufacturer for North American markets with a focus on Quebec (60% of sales in 2005) and Ontario (25% of sales in 2005). Miradas mainly serves prefabricated house manufacturers, roof truss and wall panel manufacturers, wholesale distributors, wooden pallet manufacturers, and pro-builders and renovation retailer chains. Each of these markets and client types can be conceptualized as a mean to achieve durable prosperity because of the knowledge and contacts already acquired. Many of these markets and client types can also be conceptualized as a business risk because of unfavourable trends and forecasts negatively impacting past investments of time and resources. In Miradas' case, the most significant industry transformation is that sawmills are getting better at cutting their lumber to reap the most profitable grades and lengths for their clients. Current tactical instantiation reflects which choices were made and how they now play out against these changes, while future strategic conceptualization presents which of these markets and client types Miradas intends to use as leverage for growth and prosperity.

Current Tactical Instantiation: PFM is currently located in Quebec City, and MI in St-Apolinaire, a small municipality in the Greater Quebec Area. Improvement of value creation processes will likely help Miradas reach nearly C$ 50 millions in revenues for 2006. This growth is accompanied by a sense of urgency and a genuine intent to change. Miradas is finding it harder to supply itself in cheap lumber with remanufacturing potential. As a result, distributors which sourced themselves at Miradas may now turn to sawmills directly. Yet distributors represented roughly half of the business' revenues in 2005, making very clear the need to focus on a closer client relationship with prefabricated house manufacturers, one of the industry's most promising sectors.

Envisioned Future Character: Miradas seeks to become an integrated, pull-driven value creation bridge between sawmills and builders, thus becoming an essential player in this growth sector. The key strategic issue to make this happen is to understand clients well enough to know when not to do something and stick to distribution of the sawmill's goods, when to do something through or with someone else in a sub-contracting or joint-venture agreement, and when to do something alone, through PFM, MI or a new Miradas business unit. Put another way, as sawmills integrate parts of the value chain downstream, what should Miradas leave to others, where should it stay, and what should it integrate?

Envisioned Tactical Character: Getting answers to the questions presented above means visiting key clients. This was begun in 2005. Three client visits had already taken place by summer 2006. These visits were meant to be the beginning of a larger, more structured effort to be undertaken directly by Raymond Grondin. The best tactical outlook seems to be the understanding and evaluation of complementary offers for and by prefabricated house manufacturers. An example is pre-cut lumber for roof truss assembly.

Figure 7 presents Miradas' key stakeholders in three broad categories: staff, enablers and clients. Most crucial to its design is R. Grondin, founding entrepreneur and sole owner of the business, who has no intention of retiring anytime soon, wields absolute power over business design decisions for both PFM and MI and has a major impact on Miradas' character. Grondin oversees the work of 10 to 12 employees at PFM and 20 to 25 employees at MI. PFM employees engage in sourcing, sales, logistics, administration and research & development activities under the supervision of a sales manager and a finance controller. MI employees engage in production and logistic activities under the supervision of a production manager. Notably absent is Grondin's potential replacement. This represents a high risk for the organization's continued existence should Grondin leave the business for any reason.



CLIENT type description	Revenue ranking and %	Envisioned design focus ranking
Wholesalers (lumber, doors, insulation, and various other construction components)	1st (50%)	4th
Wall panels and roof trusses manufacturers (walls and roof systems sold to builders)	2nd (20 %)	2nd
Palette manufacturers (clients for low grade lumber)	3rd (10 %)	5th
Prefabricated house manufacturers (turn key houses with on-site assembly)	4th (10 %)	1st
Pro-builders & do-it-yourself renovation retailer chains (buy & ship to local outlet / regional hub)	5th (10 %)	3rd

Figure 7. Miradas Stakeholders Pole

Most enablers are well known Quebec industry players and can be divided in three broad groups. The most crucial group is made up of lumber suppliers, the vast majority of which are located in Quebec, 3% to 5% in Ontario and the Maritime provinces, and 1% to 2% in Western Canada. The second group in term of design importance is made up of service providers, such as 3rd party logistics providers and transporters to move lumber where and when it matters. The third group is made up of knowledge providers. This group gains importance in Miradas' envisioned design since it could provide key knowledge about prefabs and pull-enabling tools and processes. Knowledge providers include the Québec Industrial Research Center (CRIQ) for industry data, statistics and information; various consultants and

professors solicited for design improvements; Grondin family members; the Forintek research center for R&D, market studies and industry knowledge; Q-Web for global market trends, outlook and contacts when it comes to export; and the Forac research consortium for learning and hiring qualified recruits in forest-to-client supply chain management. Grondin family members include a professional active in the same industry, as well as Raymond Grondin's son, a Laval University MBA student who chose Miradas as the object of various works and projects during his studies. He is the key contact who made this research possible, and did not hint at replacing his father anytime soon, if at all.

Miradas' clients can be divided into five types. Wholesalers distribute lumber, doors, insulation, and various other construction components to manufacturers and retailer chains. Wall panel and roof truss manufacturers sell wall and roof systems to builders. Palette manufacturers buy low grade lumber for the goods they produce. Prefabricated house manufacturers (or "prefabs") produce turnkey houses for on-site assembly. Pro-builder and do-it-yourself renovation retailer chains buy and ship lumber to local outlets or regional hubs which supply these outlets.

Each of these five client types has its own set of specific expectations. For example, prefabs try to do more stable business with fewer suppliers than other client types, in an effort to lower the sourcing complexity and insure the constant availability of all components required to build their houses. Each of these five client types also has its own importance in terms of revenues, as shown in Figure 7. The point is that some clients have more clout than others, accelerating or slowing down envisioned changes. The clearest example is the shift which Miradas hopes to operate with wholesalers and prefabs in terms of revenue generation. While Miradas will not turn away good customers, it will emphasize prefab outreach and business development to guide its future growth. The logic behind this shift is presented in the previous section: wholesalers are likely to become more fickle and source directly with sawmills, while at the same time slowing Miradas' efforts to develop a pull-enabled value network with stakeholders closer to the end user.

The Offer pole is presented in Figure 8. Miradas lacks the scale to offer investment value through an initial public offering. Similarly, it can neither offer development to research groups of which it is a member (ex.: through a Research Chair) nor can it sustain enabler prosperity on its own. What it can offer is worry free billing and stable revenues for the enablers it does business with. Miradas' design of offers to employees is nearly as simple. It does not offer any outstanding career opportunity, since most responsibilities ultimately converge upon the person of R. Grondin., nor does it offer peer recognition, since neither the business nor the industry stand out as community darlings. What is offered are competitive wages and stable jobs in an industry which has low educational requirements. For R. Grondin, it offers wealth and entrepreneurial self-realization.

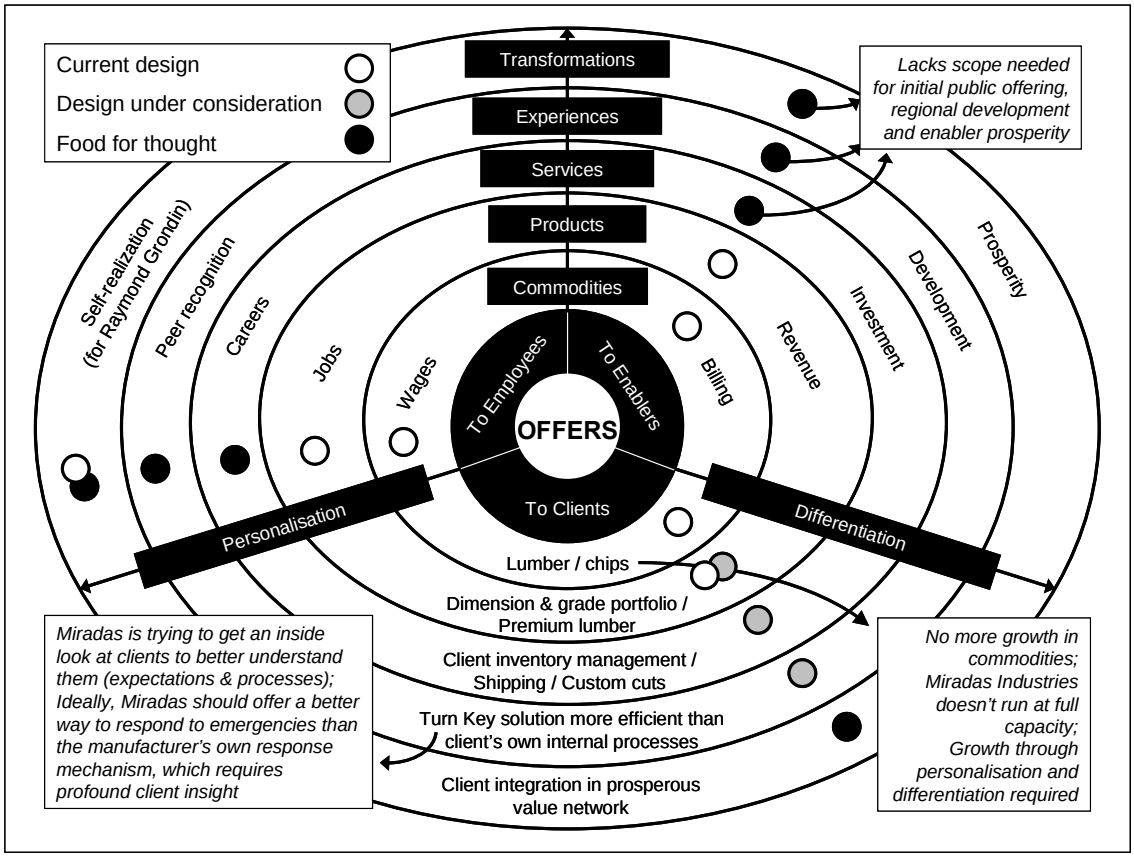


Figure 8. Miradas Offer Pole

For clients, the offer design is more nuanced. At the commodity level, Miradas offers dimensional lumber (2x3 to 2x10 square inches at lengths of 2 to 16 feet) of various grades. Lumber measuring under 2 feet as a result of the remanufacturing process is transformed into wood chips. The key business design insight is that this commodity offer faces steep global competition and does not provide Miradas with growth opportunities. In fact, MI's three production lines currently run below full capacity.

At the products level, Miradas offers a stable portfolio of lumber goods, including premium grades, thanks to its back-to-back transit inventory as well as its remanufacturing capabilities. Back-to-back transit inventory describes lumber which enters Miradas' lumber yard without going through its remanufacturing mill before being sent out to buyers. Adding distinctive and uncommon custom lumber cuts to the portfolio is currently being considered to help differentiate the offer further.

At the services level, many options are under consideration such as client inventory management, just-in-time shipping, and custom cuts for roof, wall or floor system assembly. All of these services have the perceived potential to add value to customers and reflect new industry trends, tools and practices. But none of these result from structured and significant client interviews and visits. In essence, creating these offers is possible, but may not fit with the clients Miradas' envisioned strategy is targeting, thus taking away precious resources and

mindshare if pursued. In business design terms, Miradas is still in the dark about what to do for this level of client offers and will likely remain so until R. Grondin visits more of his peers.

At the experiential level, Miradas is considering turn-key solutions which would bring more value to clients than their own internal lumber sourcing and cutting processes. Here too, Miradas is planning to get an inside look at clients to better understand them. Critical to the process is for R. Grondin to meet with presidents rather than buyers or production managers who might feel threatened by such an offer. What is already known is that for such experiential offers to succeed, Miradas would need to respond to emergencies faster and better than the manufacturer's own response mechanism. There is currently no offer at the transformational level, since Miradas is itself engaged in a profound transformation and has yet to figure out which is the best way to go.

As shown in Figure 9, Miradas orchestrates creation around PFM and MI. The first mainly creates in the intangible: knowledge, contacts, estimates about demand and offer and so forth. The second mainly deals with the tangible: inventories, lumber cuts and grading, packaging and so forth. These are not absolutes; PFM has tangible offices and MI generates intangible knowledge about its craft, but the point is that creation has been purposefully segmented in two distinct approaches for two distinct entities in two different locations so as to insulate one from the other in terms of cost and profit. Both are currently profit centers. There are three ways to bring the system to life. First, PFM solicits suppliers for quotes in order to invest in cheap lumber which it hopes to later sell at a higher price, either remanufactured or unaltered. Second, PFM solicits suppliers for quotes on a client's behalf, such as a prefab manufacturer, a distributor or a components manufacturer, either as a result of a sale or a prospective sale. Third, suppliers contact PFM to sell lumber with which they wish to depart. In no case is MI an initiator. It acts solely in response to PFM demands.

Grey boxes in Figure 9 represent stakeholders lying outside Miradas' direct sphere of control. Arrows represent resource flows, such as information, money and lumber. The gist of the creation pole lies in the four vertically aligned white boxes. PFM develops the business, such as acquiring supplies, nurturing sales and orchestrating lumber transport logistics. It administrates itself and creates the appropriate finance mechanisms to insulate the business from currency fluctuations. It also acquires knowledge about its industry, an activity which receives a lot of attention from R. Grondin, who seeks to create the proper knowledge acquisition mechanisms to achieve Miradas' envisioned strategic future.

Either as a result of client requests or supplier offers, or by its own initiative, PFM asks for supplier quotes, scans Pribec price listings and puts to good use its supplier contacts in order to locate deals and opportunities. Suppliers ship lumber to MI's transit yard or to clients directly in a back-to-back deal. Once in MI's yard, lumber either sits in inventory as an investment for future demand, or is remanufactured to extract more value. MI can transform 2x3 to 2x10 square inches lumber from 16 to 2 feet on three independent production lines. For example, an 8' long economy grade 2x6 can be cut in a 5-foot stud plus a 3-foot economy grade piece where the weaknesses, damages or imperfections of the original have been isolated on the shorter length of lumber, or completely removed and transformed into wood chips. Two MI remanufacturing lines are presented in Figure 9's zoom box.

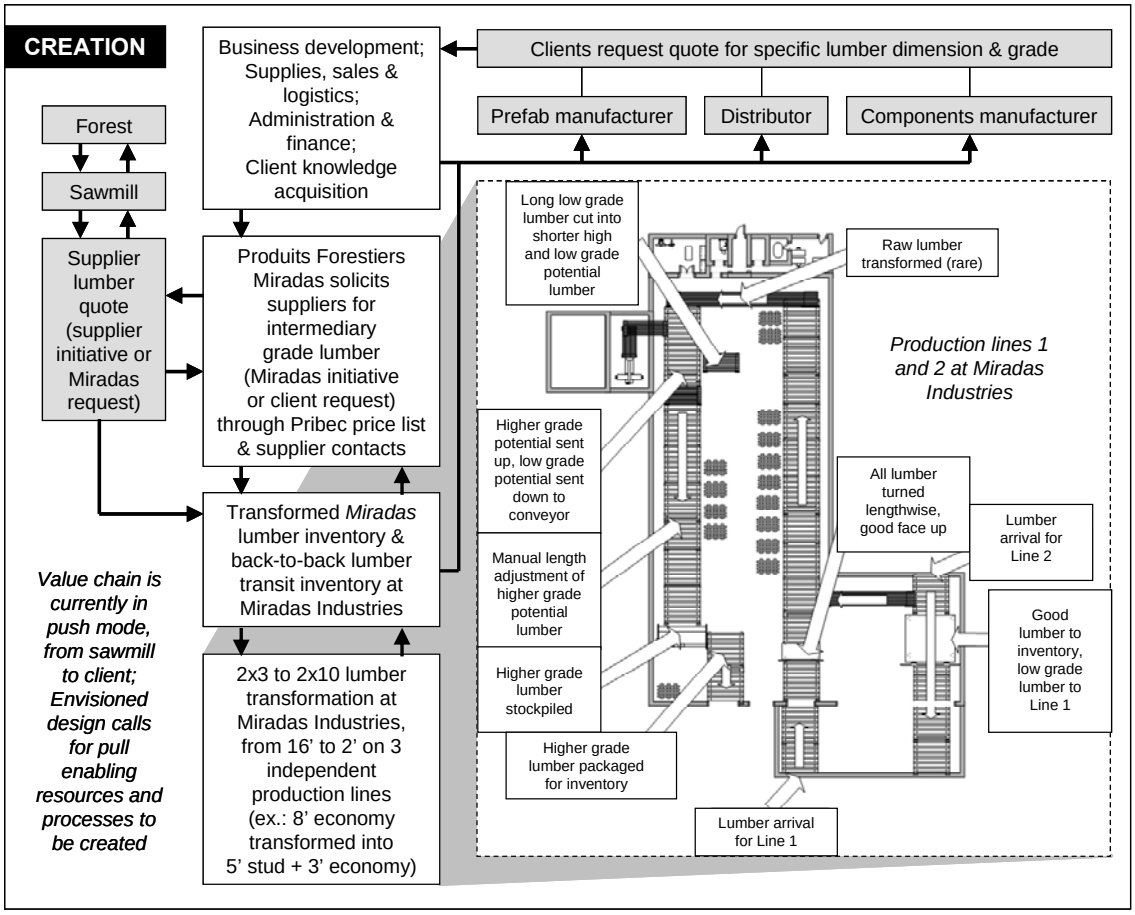


Figure 9. Miradas Creation Pole

These creation processes have been implemented in a push mindset: MI merely responds to PFM, which itself can only try to "guesstimate" future supply and demand. In essence, most tools and processes needed to make the shift from a push to a pull philosophy are yet to be created within Miradas. The first step currently undertaken is to create the contacts necessary to grow a network of trustworthy partners. Such partners would generate knowledge about what to expect from a pull enabled value network, thus lowering the risks associated with the creation of new tools and processes. As of 2006, the best potential type of partner seems to be prefabs, though much more work needs to be done to grow wise about this industry segment and how to best go forward.

This analytical snapshot of Miradas done through the Tetrahedron's four poles reveals a business with enough character to seriously consider a profound overhaul of its offers and creation processes, getting ready to leave commodity remanufacturing to sawmills, and eager to know more about its most promising stakeholders – prefabricated house manufacturers – in the hope of finding good business opportunities hidden in how they source and transform lumber for their own purposes. The two most salient business design features are R. Grondin's powerful hold on the Character pole and the ambitiousness of the change considered for the Offers pole, moving from a commodity based prefab offer to an

experiential one. The amount of change and knowledge required, and the potentialities they unlock if successful, seem almost too great to be properly leveraged by one man. Only the entrepreneur can know for sure.

4. Business Model Innovation as Dialectic Between Business and Industry Tetrahedrons

Sections 2 and 3 provide an analytic foundation to discuss business model innovation. Presenting the design of the industry in which the business realizes itself adds depth and context to the second presentation, which deals with the business itself. This does not imply that innovation should occur within the presented industry, but it does mean that the business is itself part of a holistic system which it influences, and by which it is influenced. In essence, Miradas is a stakeholder of the Quebec sawmill industry, and many other industry stakeholders are also Miradas stakeholders. Business model innovation, involving a profound, non-incremental transformation of the systemic whole, is bound to translate into tensions or breaks from systemic relations and contingencies.

Perhaps the clearest way of explaining the nature of business model innovation through the structure of this research is this: innovation seeks substantial changes in the way the business relates to the larger system, which may include a complete shift in how that larger system is conceptualized. In the business case at hand, this means Miradas no longer wishes to conceptualize itself only as part of the sawmill industry, but rather also as part of the prefabricated housing industry. In turn, this can only be acheived by understanding how it manages its current dialectic with the sawmill industry so as to leverage key interrelationships to bridge the gap to the industry it seeks to engage in the future. Without strong analytical footing about itself and the larger system which currently sustains it, moves to bridge the gap are rooted in intuition, which may or may not be enough to survive and enact the innovation strategy.

Some key points: Both Miradas and the sawmill industry are striving for pull-driven value webs as a mean to emancipate themselves from the commodity trap. Miradas is not going against the grain of industry trends. Nor is it trying to leave the industry; Miradas seeks to transform itself within Quebec, and its focus on prefabricated housing is more a new focus on a different set of stakeholders than a radical shift about which industry it designs its future self. However, tensions with creation issues seem likely. Who will orchestrate these new pull-driven value webs is still uncertain. As much as business and industry character fit seems pregnant with cooperation opportunities, it does little to diminish apprehensions and fears about who will orchestrate creation in the coming years. Miradas' intent to innovate is adequated with an intent to be part of the industry's next core team, which is to say those few stakeholders with enough clout to influence industry character and creation in the future. Miradas is thus faced with a profound dilema. Who are tomorrow's best industry stakeholders?

Identifying and engaging these potential business stakeholders, or engaging and internalizing the new system by making its stakeholders become Miradas stakeholders , is a critical task. It is one which only R. Grondin can currently assume, but the current system is already vying

for his complete attention. In all likelyhood, R. Grondin will need to engage some individual stakeholders on an internal level at Miradas. How to entice talented personnel to come onboard and how to convince prefabricated housing stakeholders to become key Miradas stakeholders is the corrolary to meaningful identification; these potential stakeholders must find gain in Miradas offers and Miradas has to leverage these contributions to bridge the gap between current and envisioned design.

Bits and pieces: Miradas is considering multiple options to identify and engage these clients, but none is an obvious fit with cheap implementation try out costs. Custom cuts, pre-cut kits for wall, roof and floor systems, client inventory management and just-in-time delivery, and so forth, all require new tools and training. In addition, value might lie in a specific portfolio of offers rather than a specific service or product, raising the cost and risks of trial by error. Enhanced offers for enablers and employees do not seem to be on the radar, which leaves the question open as to who may come onboard to help R. Grondin internally.

As stated earlier, sawmills are starting to integrate downstream operations, such as lumber grade optimization and remanufacturing. Miradas' niche and supplies are vanishing. Miradas is considering a similar downstream integration opportunity with prefabs. In downstream integration, the client's own lumber transformation unit is Miradas' main competitor, and its response time in crisis situations is the one to beat. This is one of the main reasons why Grondin seeks to meet with prefab presidents rather than production managers: Miradas' competitors are the experts who currently serve its potential clients from within. Other contemplated options which do not focus on downstream integration include selling complementary construction materials, acquiring a complementary business, and even upstream integration like acquiring a small sawmill, all of which are contingent to what preferred stakeholders actually value most.

In any case, Miradas hopes to count on MI to provide gain to clients directly instead of doing so behind PFM's veil. The upcoming design will likely mesh MI and client processes together. The challenge is to make MI's downstream integration as seamless as possible. Prefabs use proprietary software from metallic joints manufacturers to create bill of materials necessary for specific house and truss plans. Miradas currently has no experience in dealing with such software. In addition, the major joint manufacturers have incompatible standards and wield great control over who can sell their software in which territory. There are strong compatibility issues to be worked out before MI can hope to offer downstream integration to clients in a compelling manner. Just-in-time shipping in times of emergency is another concern; while things may work out with MI in the Greater Quebec area, will Miradas need additional yards for remote clients? Note that while the dynamics uniting PFM and MI are one of Miradas' basic design features, such cooperation has not necessarily resulted in the development of strong network management competencies. Miradas may have an opportunity to grow into a network, but may not have the expertise to do so.

PFM and MI are currently both profitable, but MI's days may be numbered. Miradas could likely endure as a simple distributor, selling or closing MI to preserve PFM as sawmills integrate most of MI's current activities. This is not the course of action envisioned. The gist of the problem facing Miradas with downstream integration is to understand what value is best provided by whom in a pull-enabled value web operations shuffle; in other words, who would do what best in the new networked organization envisioned. Miradas faces two

possibilities. First, it can prosper from its new operational tasks. Second, it can prosper from value web orchestration. Prospering from new operational tasks is a relatively modest undertaking when compared to the later; it preserves its current scope as one of many industry suppliers to prefabs, albeit a more specialized one than others. Prospering from value web orchestration is fundamentally different.

Value web orchestration would require first a successful local trial-by-error Miradas-prefab integration, then leading to a scale up to provincial, national, and international markets. In essence, an envisioned design would be for Miradas to become the very best prefabricated house manufacturer supplier, initially focused on lumber and Quebec, but gradually opening up to any components likely to figure on a prefab's bill of materials anywhere worldwide. This seems almost too bold to be considered seriously, but the fact is that most industries do have orchestrators who set the tone for industry practices and prosper substantially from their position within the network. For prefabs, metallic joint manufacturers seem to be in the lead through the proprietary software they distribute to help design house systems such as walls, roofs and floors. This turn of events was not a given, and in fact, metallic joint manufacturers do not hold such a strategic position in Europe's prefab industry. No one can predict with certainty which businesses will orchestrate tomorrow's prefab value webs.

Conclusion

This paper has presented business model innovation as a process of system-to-system dialectic, where at least one system seeks to substantially alter the dialectic. Two cases were presented to ground the discussion: the Quebec lumber industry case and the Miradas business case. As it has been shown, the business under study is currently redefining the importance it gives to a certain type of stakeholder (prefabs), and is altering its business model in doing so, but falls short of redefining itself as part of the prefabricated housing industry. In other words, business model transformation is under way, but innovation may warrant a better appreciation of risk before it is undertaken.

Analytical footing for both the business and its current industry is crucial to understand the dialectic to be altered. The Tetrahedron is shown to be a powerful and scalable tool which allows researchers to gain insight at both levels using the same concepts and semantic networks for meaningful system representation. Further research could be done using flows, dyads and faces, which are features of the Tetrahedron that were left unused to fit the scope of this paper.

Future research opportunities directly tied to this one include an analysis of the prefab industry, and similar industries worldwide. Other opportunities include unit within business within industry studies using the Tetrahedron, which can also be scaled to fit analysis of organizational units and departments.

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