FPInnovations - Maximizing value from the forest

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Abstract

FPInnovations is the merger of FERIC, Forintek and Paprican and a partnership with the Canadian Wood Fibre Centre, which is part of Natural Resources Canada. FPInnovations works towards optimizing the forest sector value chain by capitalizing on Canada’s fibre attributes and developing new products and markets. The presentation provides an overview on FPInnovations and describes the main focus of its research and development activities. More particularly, it presents the pivotal role that Forest Operations plays within that structure and the linkages that have been developed with both the upstream side (forest management and genetics) and the downstream side (manufacturing and marketing). Initial results from this integrated approach to forestry research are also being presented.

What is FPInnovations?

FPInnovations was created in 2007 through the merger of FERIC, Forintek, Paprican, and the Canadian Wood Fibre Centre of Natural Resources Canada, to create the world’s largest private, not-for-profit forest research institute. With over 600 employees located throughout Canada, FPInnovations unites the individual strengths of each of these forest research and development institutes into a single entity.

The main goal of FPInnovations is to strengthen the Canadian forest sector’s global competitiveness through research, knowledge transfer and implementation, in the context of a changing marketplace. Its activities span from genetics and harvesting operations to wood and paper products and beyond, all based on marketplace realities.

Some of the current research priorities include:

- Forestry and forest operations
  - identify and inventory desirable fibre quality attributes
  - develop solutions for a bioeconomy
  - improve forest productivity and maximize fibre delivery and value
  - apply precision forestry techniques to optimize operation and management processes
  - deliver solutions to suppress and manage wildland fires
  - promote environmental sustainability

- Wood products
- apply advanced technology to reduce production costs and improve manufacturing processes
- create innovative solutions to increase the quality and variety of specialty, wood-based products
- provide solutions to optimize fibre usage
- develop the next generation of wood construction products and system solutions
- collaborate internationally to strengthen building codes and standards

- Pulp, paper and beyond
  - optimize pulp and paper processes and enhance traditional paper products
  - conceive revolutionary paper products
  - identify new product streams by extracting chemicals and energy from forest biomass
  - build cellulose-based nanomaterials to produce high-performance paper and packaging
  - promote environmentally sustainable mill practices

FPInnovations’ mission is: To work towards optimizing the forest sector value chain by capitalizing on Canada’s fibre attributes and in developing new products and market opportunities within a framework of environmental sustainability.

This aspect of FPInnovations’ mission is delivered through a program called “Value Chain Optimization” which is one of four Flagship Innovation Programs.

**What is value chain optimization?**

Value chain optimization means…
...understanding customer needs, leveraging suppliers’ skills and managing to optimize the overall process, not just its discrete pieces.

The idea of value chain optimization is based on the concept of supply chain management, with the notion of product value added to that of costs. A value creation network is simply a virtual business based on information sharing and joint planning. Suppliers are an important element to consider since they are network partners. The main competitive advantages for a company implementing value chain optimization are cost and net product value, which translate into the highest margin possible on sales.

The network can improve a chain’s performance by strengthening its connections or links. The decision-making and steering system must be flexible so as to react rapidly to change. The decisive competitive advantage is the prime consideration to ensure good coordination and integration between chain links. It can be further improved by optimizing the network overall. The following table compares the differences between the “traditional” and the “value chain” business model.
Table. Comparison between the “traditional” and the “value chain” business model.

<table>
<thead>
<tr>
<th></th>
<th>Traditional</th>
<th>Value chain</th>
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</thead>
<tbody>
<tr>
<td>Sharing of information</td>
<td>Little or none</td>
<td>Extensive</td>
</tr>
<tr>
<td>Value focus</td>
<td>Cost/price</td>
<td>Value/quality</td>
</tr>
<tr>
<td>Direction</td>
<td>Raw material</td>
<td>Differentiated product</td>
</tr>
<tr>
<td>Main perspective</td>
<td>Supply push</td>
<td>Demand pull</td>
</tr>
<tr>
<td>Organizational structure</td>
<td>Independent</td>
<td>Interdependent</td>
</tr>
<tr>
<td>Philosophy</td>
<td>Self optimization</td>
<td>Chain optimization</td>
</tr>
<tr>
<td>Business relations</td>
<td>Opponents, seeking to maximize individual profits</td>
<td>Co-operators, seeking a win-win situation</td>
</tr>
</tbody>
</table>

**Why is the Canadian forest sector interested in value creation networks?**

Traditionally focused on cutting costs in isolated business units, the Canadian forest industry is now under much stress, and for many reasons. The industry must get away from commodity products by concentrating on the inherent advantages of its forests and developing new products that are not only easier to trace, but that are also certified and highlight Canadian wood and expertise. Simply put, the Canadian forest industry can no longer compete on price alone with many countries that enjoy lower cost structures; it must also capitalize on the variety and quality of its extensive forest resources and compete by offering higher quality and value products that the competition can’t produce for lack of the same quality raw material and knowhow.

To achieve this goal, the Canadian forest sector must embrace value chain optimization networks as a new business model. The implementation of value chains in the forest industry should make it possible to take full advantage of forest resources and expertise, way beyond what any single business could do on its own.

**How to implement value chain optimization in the forest sector?**

The goal of value chain optimization is to provide integrated solutions to enable the right tree to be grown, harvested, transported and manufactured into the right products to be sold in the right market. For FPInnovations, optimization of the value chain means that we will approach the genome to market concept in a holistic and integrated way. We will look at strategic linkages of different parts of the value chain and use innovation and technology to explore new linkages and new solutions to enhance value and margin. This involves shifting from a market “push mode” to a “pull mode” (meaning thinking market before product) and developing new solutions to enhance value and maximize profit.

To achieve this we must:

- Improve net value
- Improve decision processes
- Automate operations
- Optimize logistics
• Develop market-driven processes (pull)
• Implement new business models (e.g., share profits/costs)
• Create full partnerships with suppliers (e.g., contractors)

Concepts such as precision forestry, logistics, flexible manufacturing and so on will be used to give industry the ability to merchandize cost effectively at each step of the entire value chain.

Where does the logger fit in all this?

Harvesting and transportation are key links in a value chain optimization network. The ultimate objective is to maximize returns from existing forests by first identifying the attributes of different forest/tree types that can be exploited to manufacture products of higher quality and value. Once these attributes are identified within a forest type, within species, within different portions of a tree and ultimately within a log, this raw material needs to be segregated and delivered to the processing facility that can best take advantage of its specific attributes. Logging is the first place where this sorting can start. In a value chain optimization system, turning a heterogeneous resource into a uniform raw material through optimizing processing, sorting, segregation and multiple transportation delivery sites takes an ever-increasing importance. Whereas sorting by species or separation by log sizes are already common logging practices, value chain optimization will mean more sorts and more sophisticated merchandizing strategies. In such a scenario, logging, which for most companies was traditionally perceived as a cost, becomes an integral part of a production process which aims at adding value to the product at every step of the way through the chain.

In value chain optimization, harvesting and transportation are no longer activities that are disconnected from the mill manufacturing process and markets. The name of the game is no longer to supply the mill with fibre at the lowest cost. The objective becomes to supply the (right) mill with a raw material that will allow it to manufacture a product that will fetch the maximum profit margin in the market. A raw material of higher quality (e.g., fresher wood) may actually cost more at the mill gate, but may result in savings at the manufacturing phase which compensates many times for the extra cost.

Such an approach necessitates a clear understanding of the interrelationships between raw material characteristics, milling processes, product quality and cost. Modeling of the value chain from forest to market becomes an important decision making tool.

The loggers and forest engineer will still need to control costs, but their opportunity to contribute to the value of the end product will increase.

Let’s remember the basics: profit = value-cost, and profit can be increased by decreasing costs but also by increasing value. The cost of fibre isn’t as important as its worth.