

# Increasing value through Supply Chain Planning

Ian Jones

With the world changing at an ever-increasing pace, the businesses that will prevail are those which are quickest to understand environmental trends, market dynamics, and the potential of new technologies, and are then able to identify key leverage points and rapidly develop and enact effective strategies. It is not sufficient to simply develop a compelling strategy – the strategy and supporting business plans need to be translated into tangible outcomes. This paper will argue that supply chain planning is a key enabler to translating strategy into practical monthly, weekly and daily decisions that will enhance return on equity (ROE) for the business.

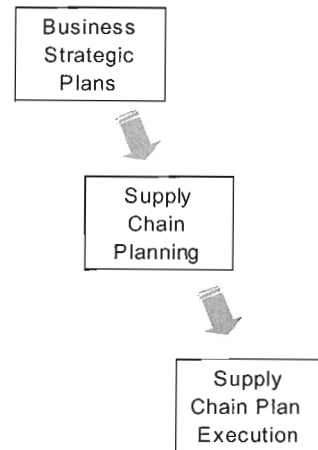
Forest products companies have often lagged other production-oriented sectors in applying leading edge planning and supply chain management techniques. Fortunately this has started to change, and the big forestry and other primary sector players in New Zealand have moved to the leading edge in the adoption of supply chain planning technologies. Carter Holt Harvey Forests, Fletcher Forests and the NZ Dairy Group have all implemented, or are implementing, IT based planning systems.

## Value Based Decision-Making

Value can be captured if high level strategic plans are “vertically integrated” with operational actions (Figure 1).

Figure 1. Integrated Planning

### Integrated Planning



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Table 1. Levels of decision making

Decision Level	Decision Horizon	Lead-time drivers	Examples of questions
<ul style="list-style-type: none"> <li>• <b>Strategic</b></li> </ul>	50 yr (NZ pine)	<ul style="list-style-type: none"> <li>• Time for 2 crop rotations</li> </ul>	<ul style="list-style-type: none"> <li>• What crops should we be establishing when?</li> <li>• What estates should we hold or divest?</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Tactical</b></li> </ul>	5 yr	<ul style="list-style-type: none"> <li>• Time to plan, design and construct harvesting infrastructure</li> <li>• Time to flex harvest and distribution resource capacity</li> </ul>	<ul style="list-style-type: none"> <li>• Where should we be investing resource in infrastructure?</li> <li>• What harvesting capacity should we be holding in three years time?</li> <li>• What is our harvest schedule? When are we going to harvest each part of the estate?</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Operational</b></li> </ul>	18 months (0-3 month focus)	<ul style="list-style-type: none"> <li>• Time to find the right markets to realise crop value</li> <li>• Time to pre-build inventory for export shipments</li> </ul>	<ul style="list-style-type: none"> <li>• What grades should we be establishing markets for?</li> <li>• How much of each grade can we promise to each customer?</li> <li>• How much of each grade should we be cutting where and when?</li> <li>• Where are we expecting to send quantities of each grade of log?</li> </ul>
<ul style="list-style-type: none"> <li>• <b>Executorial</b></li> </ul>	0-1 week (hourly to daily focus)	<ul style="list-style-type: none"> <li>• Time before actual achievements are reviewed against the plan by the Woodflow Planner</li> </ul>	<ul style="list-style-type: none"> <li>• How should we cut up each stem to meet orders and maximise value?</li> <li>• Which truck should be dispatched to collect a load?</li> </ul>

Effective supply chain planning acts as the “glue”, integrating business strategic plans with their execution. It does this through explicit recognition of objectives, guidelines and policies developed through the strategy, and by producing detailed purchase, production, sales and distribution plans. Supply chain plans recognise business capability and resource, sequences of activities, lead times, and costs and revenues in order to realise business objectives, thereby adding value in a practical way.

### Successive Refinement

The principle of *successive refinement* helps shape how supply chain decisions are made (Table 1).

As every forester knows, “real time” decisions at the executorial level (for example, at the skid or alternatively while taking an order from a customer) are capable of destroying value. Good planning needs to go hand in hand with good execution. How each stem should be cut, and where each load should be sent are critical day-to-day decisions. A large forestry business will make thousands of executorial decisions every day and the decision points are spatially dispersed.

For these reasons, logging companies need to ensure they have good “shop floor” execution, control and monitoring systems with robust decision support capability. Examples of these would include cutting instructions driven from the production schedule, high volume scaling technologies (e.g. scanners) with optimisation algorithms, and production data capture systems for monitoring and control.

### Integrated Decision Levels

Each level of decision is subject to guidelines developed at the higher levels (Figure 2). Overall business strategic plans drive strategic supply chain planning, which produces an annual harvest cut plan, based on optimal rotation age, sustainability considerations, etc. This in turn acts as a guide for tactical supply chain planning.

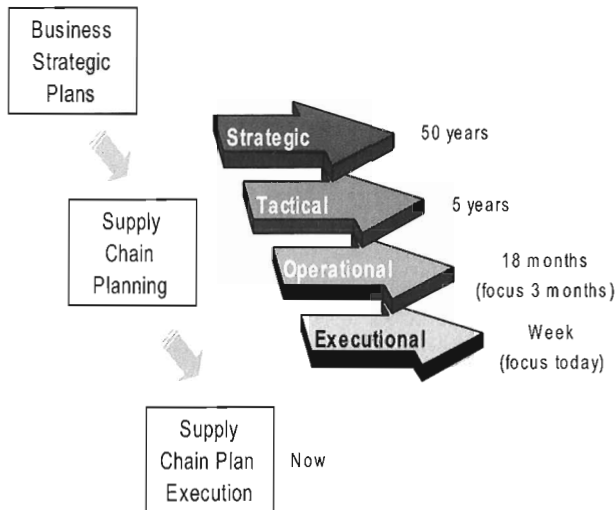
A key objective in planning should be to maintain multiple options so that near term decisions made at a detailed level are not unnecessarily constrained. Care should also be taken to ensure that decisions made at lower levels to resolve current problems for example, do not, intentionally or unintentionally, affect or limit opportunities for value capture when viewed across a longer horizon.

No one is able to predict future prices with certainty, particularly for long term strategic horizons. However, coupled with techniques like scenario planning, a robust strategy that maximises returns under various likely scenarios can be derived. Additional techniques that can aid decisions, including when to take an action and what action to take, include causal factor analysis, systems dynamics and econometrics. Models developed using these techniques can powerfully demonstrate how policy levers, e.g. planned harvest production capacity, can influence likely outcomes, for example, cash flow returns on equity.

The tactical level of supply chain planning typically uses a combination of financial and spatial/engineering

Figure 2. Planning Levels

## Planning Levels



decision making techniques, to identify the right areas for infrastructure, obtain necessary resource and lease consents, and to build and maintain appropriate capacity for harvesting and distribution.

The key challenge of deciding when to harvest which trees can be made as late as possible on the basis of real market prices if the business has built the right options in infrastructure and operational capability. A key reason the beta ( $\beta$ ), the measure of risk, for the cyclical Paper and Forest Products sector ( $\beta = 0.66$  in the USA) is lower than the total market for all sectors ( $\beta = 1.0$ ) is that management can choose when to harvest within the commodity cycle, therefore containing volatility of earnings. Operational supply chain planning can support this by integrating business strategies and plans to deliver value when the plans are carried out.

### Operational Supply Chain Planning

Assuming short term EBIT considerations are tempered with the longer-term picture, good operational

supply chain planning can act to capture maximum value by:

1. Fine-tuning the harvest schedule to best capture market opportunities within operational constraints;
2. Optimally allocating product to markets, and allowing sales personnel to enter into sales negotiations confident of supply capability; and by,
3. Providing plans that maximise margin through cutting the right quantities of customer grades in the right locations to maximise revenues, minimise operational and working capital costs, and minimise downgrading from valuable grades (for example, downgrading pruned saw log to low value grades, such as pulp).

Forest products businesses have a number of similarities to mining companies. Both primary sectors are focused on extracting a natural resource and can typically turn the raw material into many different end products, each commanding a different price in the market. Both demand and prices may vary by market, and will change over time. The resource is often geographically spread, and there is a degree of uncertainty as to what raw resource will finally be extracted.

All this adds up to a high level of complexity both through the multiple inter-relationships and options that exist at each stage in the supply chain, but also through the sheer volume of data. Like the mining industry, the forest products sector is information and data intensive, and recognition has begun to grow that the businesses with the smartest and most responsive people and systems can gain competitive advantage.

### Supply Chain Decision Support Systems

The relatively mature forest products sector is well suited to IT-enabled optimisation. Optimisation is generally suited to distribution/asset/capacity-intensive industries that are faced with production allocation choices, sales and operations issues, and with many production outturn and distribution choices in the supply chain network. There are a number of configurable software solutions that can be used to model forestry businesses. The powerful linear programming-based

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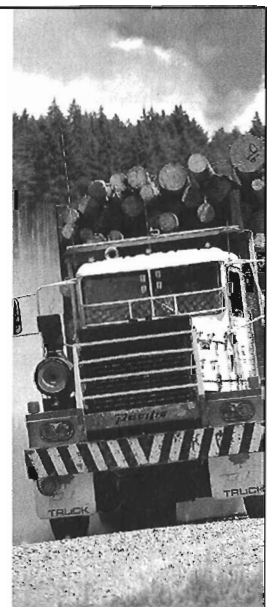
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“engine” of a software system like Numetrix, can rapidly solve complex problems involving millions of variables.

The impact on supply chain performance can be significant. Depending of how efficient the business is, inventory reduction levels of 15%-60%, supply chain cost reduction of 20%-30% and improved delivery performance of 20%-30% are typical of possible improvements.

The software technology is only part of the solution. Key to success in managerial decision making systems is, firstly, the importance of good data capture and handling procedures, and secondly, recognition of the “socio-technical” context of decision systems.

### Garbage

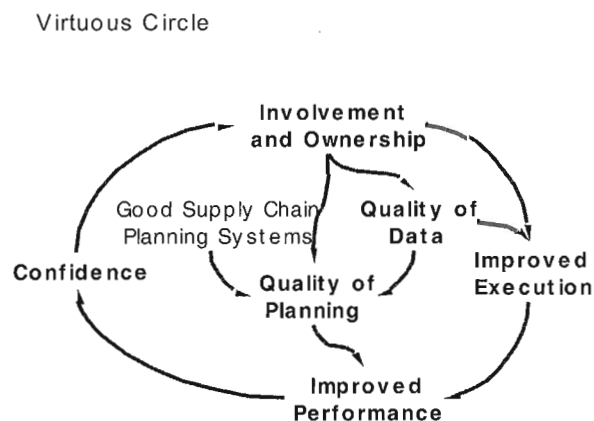
Indeed. *Where is the information we have lost in data?* Recent trends such as “data mining” have gained profile for their promise to provide competitive advantage by uncovering the mother lode in business data. Information, or processed and structured data, provided by supply chain planning systems, along with observation of outcomes following decisions, can improved understanding of market/operational dynamics and profit drivers.

The promise of useful information from planning systems is seductive, but the truism, *garbage-in, garbage-out* applies. Businesses wishing to use sophisticated systems need to place heavy emphasis on managing the data within the business. Forest products businesses are, increasingly, as much about information management, as about managing physical flows of logs and other products.

### Virtuous Circle

In addition to data management, the second requirement is recognition of the socio-technical context. Involvement of the key stakeholders, managers, planners and staff responsible for data capture (for example order entry staff), is critical both during, and after, implementation of a technical system.

Figure 3. Virtuous Circle of Performance



Supply chain planning management should be striving to trigger the natural self-reinforcing “virtuous” circle as shown in Figure 3. Catalysts to mobilising these dynamics include mobilising top management commitment, education, data integrity reporting, performance reporting and the management of expectations.

Confidence, built on positive planning results, will build support for the system and people-aligned processes. Used appropriately, supply chain planning systems are capable of providing the necessary insights so that Arie du Geus’s *sustainable competitive advantage* becomes a reality. Good plans, well executed, mean effective business.

Ian Jones  
Manager, Supply Chain Project at CHH Forests

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