THE SUPPLY CHAIN MANAGEMENT PROCESS

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The primary purpose of this introductory article is to provide an overview of supply chain management principles and to indicate how an effective supply chain management process adds value to all types of businesses.
It also aims to initiate the understanding of some core concepts such as: It is communication and trust between people, not only processes or technology, which make things happen. It is critical to have data sharing and interaction between all stakeholders in the total supply chain.

For every business transaction there is a supplier and a customer and there are activities, facilities and processes linking the supplier to the customer. The key objective of Supply Chain Management is to provide best value to the customer at each level of the chain by measuring, planning and managing **all** the links in the supply chain for the value of the chain as a whole.

Supply chains vary significantly in complexity and size, but the fundamental principles apply to all businesses whether

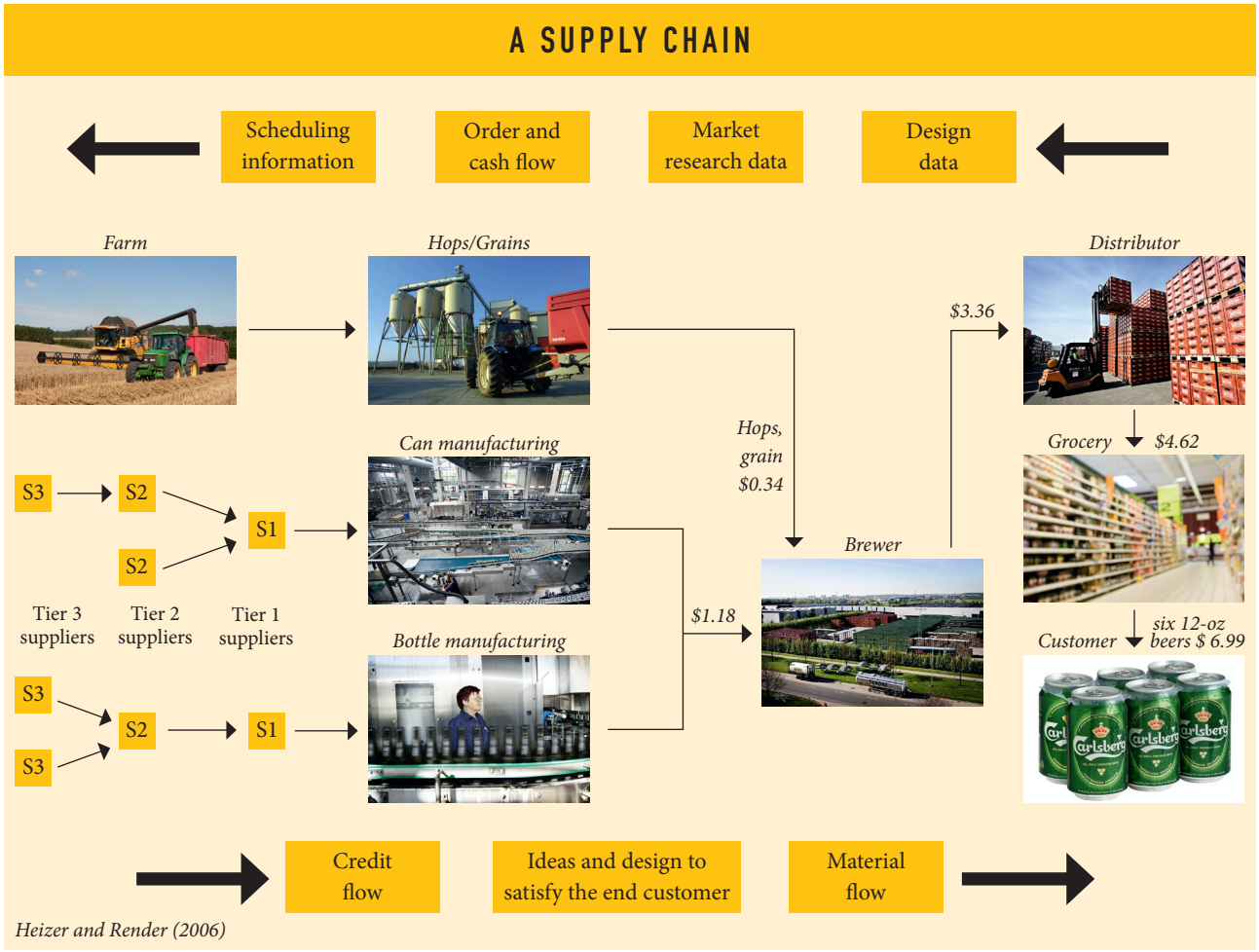

Illustration 1: Simplified Supply Chain. (Photos from: Colourbox.com, Carlsbergdanmark.dk, Carlsberggroup.com, Nrgdesign.dk)

> WE SEE THE SUPPLY CHAIN NOT AS A SERIES OF SEPARATE OPERATIONS AND ORGANISATIONS BUT AS A COMPLETE END-TO-END PROCESS OF HARVESTING, MANUFACTURING, WAREHOUSING, TRANSPORTING, DELIVERING AND ULTIMATE CONSUMPTION.

large or small. Supply Chain Management is not just for large organisations such as IBM, Wal-Mart, and Toyota.

In a typical supply chain, raw materials are procured and items are produced at one or more factories, shipped to warehouses for intermediate storage and then shipped to retailers or customers. Each member of a supply chain will have a different understanding of what a supply chain is reflecting in the nature of their business and the inputs and outputs produced. For some, supply chain is related to purchasing and procurement, to others it is warehousing, distribution and transportation. Yet for others, the emphasis will be on sources of capital and labour.

Our definition includes all value-added activities required to plan, source, make and deliver products and services that ultimately meet customer needs. This includes the flow and exchange of information and the flow of money. Supply Chain Management is a process aimed to optimise integration of suppliers, manufacturers, warehouses and distribution, so that product is manufactured and delivers at the right quantities, to the right locations, and at the right time, to reduce costs over the whole chain to satisfy customer requirements. The objective is to optimise the chain as a whole and not just one component of the chain and it is more than just the flow of materials.

Supply Chain Management considers demand, supply and inventory needs for each item of production and in particular looks at how inventory flows through the system to achieve output to the customer's specification, in the right quantities, on time and at least cost to the chain as a whole. With Supply Chain Management, customer service is increased through the reduction of lead times and the product is always exactly as specified and it is always delivered on time. This is the delivery of a 'perfect order'. Costs are reduced through the elimination of any activity that doesn't add value and through the reduction of inventories of material and associated holding and handling costs throughout the chain.
We see the supply chain not as a series of separate operations and organisations but as a complete end-to-end process of harvesting, manufacturing, warehousing, transporting, delivering and ultimate consumption. A simplified supply chain taken from an American textbook is illustrated on the left-hand page.

Illustration 1 shows the up-stream flow of information, cash, and data and the downstream flow of credit, ideas and design, and the flow of materials to the end customer.

Activities and measures based on customer requirements are very important in improving business performance. But →

Table 1: Performance Gap Matrix

	RESOURCE EFFICIENCY (VOB)			VOICE OF CUSTOMER (VOC)		
	Machines 1st	Suppliers 2nd	Labour 3rd	Specification 1st	Price 3rd	Time 2nd
PERFORMANCE	OK	70%	80%	80%	OK	60%

externally driven customer-based measures have to be matched by measures of what the company can do (feasibility, capacity, know-how and resources) to consistently meet customer expectations. A high standard of customer performance derives from planning, processes and actions integrated across the whole organisation. Externally, the measures include the suppliers at one end and the customer at the other end of the supply process. These externals, the supplier and the customer, are matched with the internal requirements of the manufacturing process.

In any business or operation, a manager has to find a balance between two conflicting objectives of demand from customer and supply from operations, the 'voice of the customer' (VOC) and the 'voice of business' (VOB). Although customer service is the primary objective of Supply Chain Management, the level provided has to be sustainable and affordable to the business. Thus, the secondary objective of Supply Chain Management is to reduce costs and to be efficient in the use of resources. For simplicity, the three basic parameters of customer service are Specification, Price and Timing. The customer expects the goods or service to be delivered according to acceptable standards, to be of an affordable price and that they arrive on time. The relative importance of Specification, Price and Time could change depending on market conditions, competition and demand. Given infinite resources, any business can provide adequate customer service, but many companies have gone out of business in spite of possessing satisfied customers, Wright and Race (2004). To provide a sustained and sustainable level of customer service, efficient use of resource is essential. When we study the objectives of VOC and VOB, they have one thing in common, and that is Cost and Price. If we can reduce the cost of production of goods or services by improved resource utilisation, then we are in a better position to reduce the price and/or to improve the service at no extra cost to ourselves and/or to increase our margin of profit.

Table 1 on the previous page is derived from work for a medium-sized New Zealand company. The relative importance of the key parameters for VOB were resource efficiency (i.e. Machines, Supplies and Labour) and VOC (i.e. Specification, Price and Time). It was found that the customers' first priority →

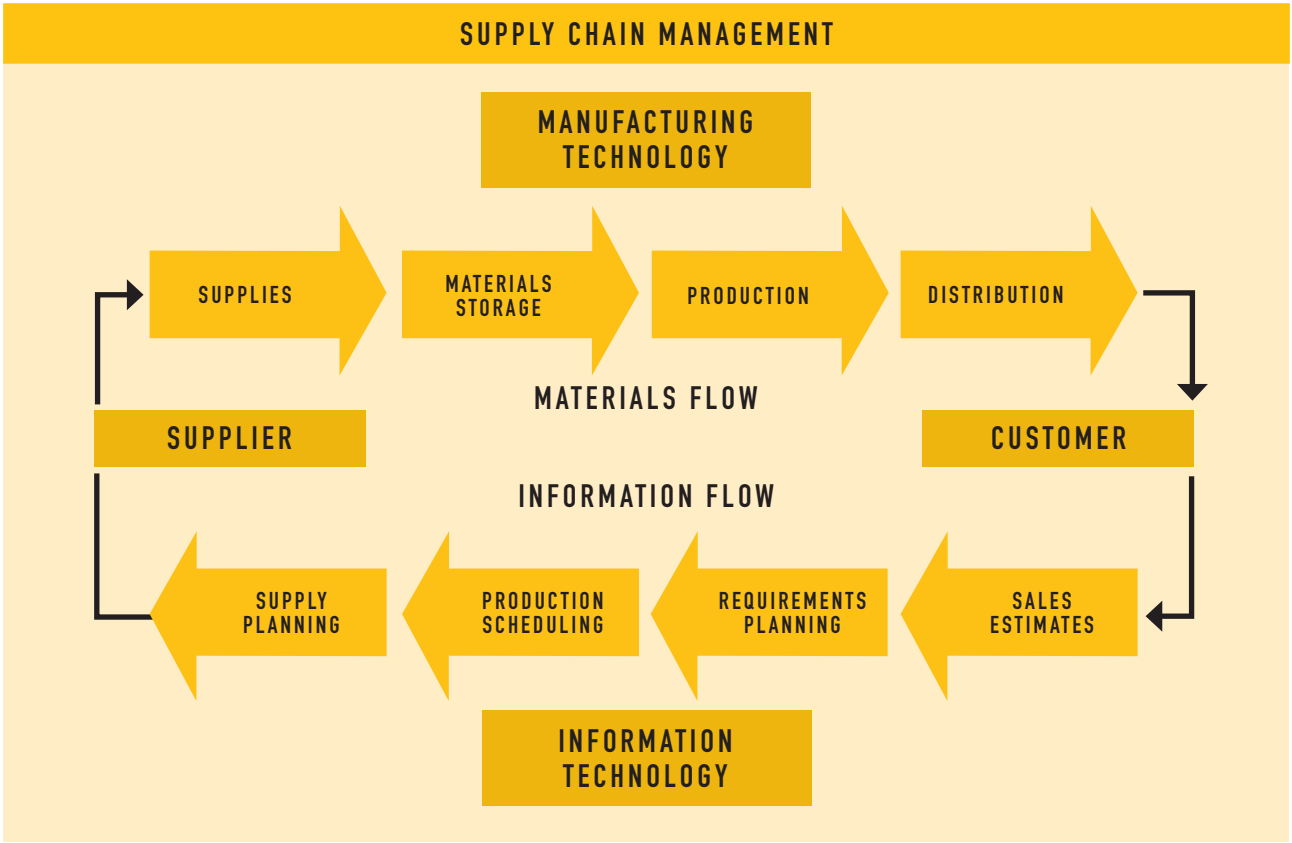

Illustration 2: Linear supply chain

was that our product met their specification. Although on-time delivery was important, it was no use if the product arrived on time but was below the required standard. In our example, the customer gave a performance 'score' of 80% for meeting specification (quality) and 60% for time (late deliveries). Price was OK. Having established the customers' perception of the service provided, the next step was to determine why the rating was below 100% for Specification and on Time delivery. In the consequential analysis of the three key resource inputs, it was found that machines and equipment were first class (latest technology, well maintained with no unplanned down time), the people had the requisite skills, were reliable, the error rate is low, but there was some idle time (productivity could be better). It was thought that improvements to people efficiency with more training could be achieved. However, the major constraint was that our suppliers were not sufficiently reliable (late deliveries and materials not always up to our quality standards). Action was taken to improve communication with key suppliers as to what was required. Gap analysis does not provide solutions to the conflicts, but identifies broad areas for attention.

It is also important to note that the relative priorities of VOB and VOC can vary within the same business depending on the product and customer. To find solutions, the Supply Chain Manager will seek other tools, techniques and processes of Supply Chain Management such as Enterprise Resource Planning (ERP), which we will explain in later papers.

The old approach to manufacturing was to buy from preferred suppliers and to negotiate terms and conditions to maximise your individual position and profit. Heavy reliance was placed on legal contracts and, if a large consumer, using purchasing power to gain favourable terms. Internally, Supply Chain Management would be considered to be the combining of functions of the business to plan, source, make and deliver products and services that meet customer needs as efficiently and as profitably as possible. In dealing with suppliers and immediate customers, the aim would be to get as good a deal as possible in buying from suppliers, and to get the best price from the customers and to maximise our profit. The belief being that for every winner there has to be a loser, and the best way to maximise your position is to be the winner.

Our approach for Supply Chain Management is to maximise the value for the complete chain. This is achieved through unreserved sharing of information and benefits. To do this, some long held beliefs, such as the concept of not sharing information for commercially sensitive reasons, have to be overcome. In reality, very little can truly be kept secret in today's global environment. Any new advance in manufacture and technology will soon become common knowledge, copied and invariably be improved upon by the competition. Sharing of information and trust, not reliance on contacts, is the corner stone of true Supply Chain Management.

The individual components of Supply Chain Management are not new; we all have been managing parts of the supply chain for years (e.g. buying, planning, scheduling, stock control, warehousing, logistics, distribution, etc.) without fully realising the significance of the whole chain concept. Likewise, the cost of the various elements of supply and distribution has been long recognised, over 90 years ago, for example, Ralph Barsodi (1929) wrote, 'between 1870 and 1920 the cost of distributing necessities and luxuries has nearly trebled, while production costs have gone down by one fifth – what we are saving in production we are losing in distribution'.

As indicated in illustration 2 on page 14, the traditional supply chain was concerned with a linear flow of information and products/services from customers to suppliers through various stages of processes while the information flow was the domain of the commercial division and the conversion process of materials flow was a manufacturing or technical division responsibility. During the 1990s, the concept of total Supply Chain Management shifted the responsibility for all elements of supply chain from cross functional control by one function either Operations Management or to Supply Chain Management.

The 'old' approach was that one department or function would be responsible for purchasing goods and services, another for planning. Scheduling of activities was often a separate function, as was warehousing and distribution, and operations were just one step in the whole process of providing services. With the value stream approach, functional boundaries are ignored and in many organisations it is now accepted that the operations

manager has to control the total process from purchasing input goods and services to the final stage of satisfying the customer. Marketing, accounting, human resources and other support functions do not show up on the value stream as such, but operations managers must be vitally interested and involved in these internal functions of the organisation.

The success of a supply chain is underpinned by the interaction between three key groups of players, viz. customers, external suppliers and the departments involved with the primary and secondary activities of the organisation.

The customer is the central focus for any organisation. Marketing is too important to be left to the marketing department. Everyone in an organisation should be vitally interested in marketing the organisation. Nonetheless, it is the function of the marketing department to *determine* what the customer wants and what the competition is doing or is likely to do. Marketing specifies the product and its attributes. Attributes may range from the essential down to the desirable and perhaps include extras that the customer does not need. As well as defining the product or service to be offered, marketing has to establish the price, forecast demand, have a say in how the product or service will be distributed or delivered, and, finally, marketing is responsible for promotion with the aim of stimulating demand. Marketing also has to sell the product/service internally within the organisation to the operations and other functions of the organisation. Marketing is the link with the market and customers and operations.

In some organisations, suppliers are treated with distrust and the business strategy adopted is to shop around and to get the best deal on each occasion. In these types of organisations, information is not shared with suppliers. When orders are placed, the suppliers are not told what the purpose of the order is and, thus, are not in a position to advise, even if they were so inclined, of alternative products or new technology. With this approach, little loyalty is shown to any supplier, and the supplier is almost treated as an adversary. The value stream approach is to treat key suppliers of goods and services as part of the team, and to share information and to seek advice. Key suppliers are those that are important to the smooth operation of the system. In some cases, the supplier can become involved in the day-to-day operations of the organisation and might also be expected to advise and to assist in product development. Cost no longer becomes the key issue. Instead of price alone, suppliers will be judged on their loyalty and ability to deliver goods and services to the required standard and on time. Suppliers can also become part of the information-gathering arm of the organisation; often, suppliers have a different perspective as to what the competition are up to (changes in buying patterns, timetables, new packaging, use of new materials and so on). Suppliers are also in a good position to offer technical advice regarding new technology and alternative materials.

Communication between departments (especially marketing, operations and logistics) within an organisation has to be two-way and has to be aimed to help rather than as a means of apportioning blame or criticising. The same approach applies with key suppliers. With traditional hierarchical organisations, a bunker mentality can develop whereby each function is walled off from the other, and any suggestion, no matter how helpful, is taken as a threat or a challenge. World-class organisations are noted by the manner in which the figurative brick walls that separate functions have been broken down, and by the teamwork that exists between all functions to achieve the common goal. This requires that everyone in the organisation knows what the goals and objectives are and that the culture is conducive to the enthusiastic pursuit of the goals for the common good of the whole, rather than for the specific interests of one department. Information is open to all and to key suppliers, and there are no secrets.

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