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**The value chain approach
imposes increased expectations
on logistics management**

By

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ABSTRACT: As business organisations move toward network structures, and virtual models replace vertical organisations (or begin to become part of them), it is time to consider the role of logistics management in light of these developments. The value chain / value creation system (VCS) has introduced a radical view concerning the ownership and use of assets, processes and capabilities; ownership has been replaced by access and collaboration. This working paper considers the challenges confronting logistics management and explores the ways in which logistics management may become involved in these developments.

KEY WORDS: *Network systems; virtual organisations; value chains; logistics management*

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1. Introduction

Towards the end of the 1990s a number of manufacturers appeared to be considerably more successful than others. Wise and Baumgartner (1999) investigated the reasons behind the differences and found that the companies were quite diverse in their industrial activities (Honeywell, General Electric, Nokia and Coca-Cola) however, what they did have in common was that while they built on their core manufacturing capabilities they also invested heavily in developing understanding and competency in the downstream activities that were, hitherto, the provinces of their reseller partners. The manufacturers' intimate knowledge of their markets identified opportunities for them to provide complementary products and service facilities. The authors argue that to pursue such a strategy successfully requires a "new way of thinking about strategy".

Until the late 1990s vertical integration was the dominant business model. Vertical integration achieved economies of scale, an essential feature of competitiveness; it also brought control of supply markets and a disciplined approach to product research and development. The results proved the efficacy of the vertically integrated model. Both margins and productivity were high for a period. However economic growth began to decline requiring manufacturing to respond to this new challenge. A significant factor according to Wise and Baumgartner was the *installed-base-to-new-unit ratio*. Essentially this ratio compares the growth rates of sales of new products to the sales of service (and parts if applicable) in a product category; they identify a ratio of 13:1 in the automobile market indicating a static rate of sale of new vehicles but a rapidly growing after sales service market. The stagnant product demand and expanding installed rate encourages value migration; as economic (added) value moves downstream, away from manufacturers towards service providers.

This transformation of a large number of industry structures has revised the approach to vertical integration as market added value migrates towards reseller and service organisations. It has also transformed the structure of these sectors; the independents and the small chain retailers have given way to large scale and powerful national (and increasingly international) operators who in many cases have overtaken the manufacturer as a brand with which the consumer identifies. Value migration is a significant factor in a number of industries. Industries undergo structural changes as end-user customer expectations change. For example, numerous industries have become more service oriented in recent years reflecting supplier efforts to differentiate their value offer to target customer groups. Yet another example concerns the application of new technology to both product and production processes. The significance this has for organisations that work in partnership networks is that due to changing patterns of value migration some firms may find it necessary for them to reposition within the value chain, leave the network, or perhaps develop more relevant processes and capabilities. The strategically effective organisation not only understands that this occurs but *monitors* the changes. For many organisations the hitherto important economics of scale and scope have been replaced by the economics of integration and coordination.

Wise and Baumgartner suggested that organisations had an opportunity to "move down stream" and capture the value that had migrated towards the resellers and service organisations. Increasingly that choice is being eroded by the strength of the large intermediaries; Wal-Mart globally and Woolworths locally being examples. However the approach developed by Kay (1993), together with the installed-base-to-new-unit ratio

from Wise and Baumgartner, does offer a means by which value migration can be measured and its implications for the organisation assessed.

The value chain offers quite a different approach. It has applied network thinking to the evaluation of strategic alternatives together with a radical approach to the role of partnerships. *New business models* are emerging, ones in which competitive advantage is based upon *managing processes* that facilitate rapid and flexible responses to 'market' change, and ones in which new *capabilities* are based upon developing unique relationships with partners (suppliers, customers, employees, shareholders, government and, often, with competitors).. The business model has often taken second place to strategy in management thinking and focus. Normann (2001) discusses "a new strategic logic". He suggests that: "...managers need to be good at *mobilizing, managing, and using* resources rather than at formally *acquiring* and necessarily *owning* resources. The ability to reconfigure, to use resources inside and particularly outside the boundaries of the traditional corporation more effectively becomes a mandatory skill for managements".

More recently there has been a significant transformation in emphasis and focus by Australian manufacturing industries. Lloyd (2007) reports on a dramatic shift in the type of business now becoming successful in areas that were once dominated by "high volume – low value" manufacturing such as textiles (apparel and footwear) are now being replaced by food processing, advanced aero space, pharmaceuticals and medical devices. Lloyd quotes the Greater Western Sydney Economic Development Manager who reports significant statistics: "while manufacturing has fallen from 21 per cent of the regional economy two years ago to 19 per cent today, in value terms it has risen from \$14.4 billion to \$15.5 billion. This compares with the NSW total of \$33 billion." It is developments such as this that suggests further challenges (and opportunities) exist for logistics management, but equally it suggests that logistics managers need to adjust their approach to these developments if they are to be successful.

2. The value chain approach

The traditional approach to the value chain was espoused by Porter (1985) who argued that organisations had *value chains* comprising operational functions and support functions. And while the organisational value chain linked into an industry value chain the focus was on achieving cost reduction within the organisational value chain. Customer expectations were a given in as much as they were identified and assumed acceptable. Little or no attention was given to the notion that customer expectations were dynamic and are influenced by external variables that may have not been identified as and when a product-service was being developed as a response to an identified need or opportunity.

Parolini (1999) argues that the changes in the business environment require a new or different approach to strategic analysis, suggesting that models developed in the 1970s and 1980s are limited in a fundamentally different economic paradigm. Parolini (as does Dunning (1997) comments on the changes in "strategic boundaries", suggesting that the 'new business model' is characterised by an emphasis on specialisation *and* a capacity to identify and participate in alliance networks. For Parolini a shift in emphasis has occurred (at least amongst the successful organisations) in which the focus has shifted from the inward enterprise focussed perspective to an outward customer focus that considers how additional value (relative to that offered by competitors) can be delivered to customers via *value creating systems*.

Value creating systems were identified by Normann and Ramirez (1993) who argued that successful companies focus their strategic analysis and decisions on the value creating system (VCS) - the suppliers, business partners and customers - and how they can work together to *co-produce* value. Parolini proposes a basic difference between Porter's original value chain and the approach taken by Normann and Ramirez (and indeed subsequent approaches) suggesting:

" ...the former (Porter) takes the company value chain as his starting point, whereas the latter (Normann and Ramirez) underline the greater importance of the value creating system."

This comment does not identify the fundamental difference that is that value creating systems (VCS) first consider customer expectations then considers the capabilities, assets and other resources required to meet customer value drivers - or exceed them! Clearly there are constraints. From a corporate view point customer expectations typically represent an ideal that may be unrealistic and need to be viewed within the context of corporate value drivers.

Parolini summarises the main characteristics of the value creation system as:

- A set of activities that creates value for its end-user customers.
- Activities use tangible and intangible resources that are linked by information flows.
- End-user value is influenced by the way in which the end-user uses the delivered value.
- End-users can (and often do) participate in value creating activities.
- Value creation is successful only when a coordinating activity (or process) is present and links customer expectations to the economic activity of the VCS.
- VCS partners may participate in more than one value creation system.

Bovet and Martha (2000) use the term *value nets* in an argument suggesting them to be:

"..... a business design that uses advanced supply chain concepts to achieve both superior customer satisfaction and company profitability".

"..... a value net begins with customers, allows them to self-design products, and builds to satisfy actual demand".

The customer (business unit) is central to the decision process surrounded by the company (or business unit) which in turn is surrounded by a constellation of providers that perform some or all of the sourcing, assembly and delivery activities. The authors offer five characteristics that distinguish a value net business from the traditional business model:

- *Customer aligned.* Customer expectations initiate sourcing, building and delivery activities in the net. "The customer commands the value net."
- *Collaborative and systemic.* Companies engage suppliers, customers and possibly competitors in a unique network of value-creating relationships. "Each activity is assigned to the partner best able to perform it."
- *Agile and scalable:* Flexible manufacturing and distribution enhanced by information flow design facilitates responsiveness. "Everything in the value net, physical or virtual, is scalable."

- *Fast Flow*. Lead times are rapid and compressed. “Rapid delivery goes ‘hand in hand’ with reliable and convenient delivery.”
- *Digital*. E-commerce is a key enabler. However, it is the flow of information and its ‘intelligent use’ that drives the value net. “Rule-based, event-driven tools take over many operational decisions. Distilled real-time analysis enables rapid executive decision making.”

Value net advocates argue that by identifying the *activities* involved in end-user satisfaction does have problems. One problem concerns the extent of the analysis, the VCS activity system could become too large to be analysed effectively resulting in a waste of management time on activities that the individual company cannot influence in any way. Paroloni suggests:

"... it is important to have an overall reference model but, within the framework of this model, the magnifying glass needs to be used to scrutinise only those parts of the system that the company under investigation can influence in some way"

Sawhney and Parikh (2001) ask questions concerning value trends in the network age. They contend that value in a networked world behaves very differently than it does in the traditional, bounded world. They suggest the elements of infrastructure that were once distributed among different machines, organisational units and companies will be brought together. Shared infrastructure (*value in common infrastructure*) will include not only basic information storage and dissemination but common functions such as order management, and: “...even manufacturing and customer service”. This is a similar view to that proposed by Hagel and Singer (1999) that will be introduced below in a discussion on the changing role of logistics and supply chain management.

They also suggest *value in modularity* as a trend. Here their concern is with the entire range of: “Devices, software, organisational capabilities and business processes”. These will be: “restructured as well-defined, self-contained modules and: “value will lie in creating modules that can be plugged into as many different value chains as possible”. Examples of modularisation can be found in automobile production. And the authors conclude; “value in orchestration” will become: “....the most valuable business skill”. Modularisation will require an organisational ability and the authors suggest: “Much of the competition in the business world will centre on gaining and maintaining the orchestration role for a value chain or an industry”.

A fundamental difference between the value net model and Porter's value chain model is that the VCS is considered to be a set of value creating activities (rather than companies), and these activities are defined from the final customers point of view. It is argued that:

"Taking the VCS as the focal point of strategic analysis is of utmost importance for those companies who want to avoid being trapped in outdated perspectives as to how to compete in their particular industry, and which understand that there is little sense in enjoying a strong competitive position and having a high bargaining power in relation to their direct customers, if they (and their customers) form part of a losing system". Parolini (op cit)

This assumes that all organisations are primarily customer focussed. Value net analysts assume that if customer satisfaction is maximised then so too is shareholder value, or perhaps (as the arguments of many suggest) shareholder interests are ignored!! This

approach clearly has problems. Understanding customer expectations is essential, but the argument that by meeting them precisely guarantees shareholder satisfaction does not follow. Many practitioners would argue that corporate expectations are the overriding consideration and that provided these are met the parameters of shareholder value are satisfied. This may imply that often customer value expectations are optimised within constraints set by corporate value drivers and that marketing objectives such as market share revised, but, they argue the business will remain viable. This notwithstanding the essential points that emerge are that value creation systems start by identifying customer expectations *then* work on the available options to deliver customer satisfaction. The process may require several iterations before a mutually agreeable match between customer and supplier expectations is reached.

The development of the value chain approach (the move away from vertical integration towards virtual organisations) is shown as **Figure 1**.

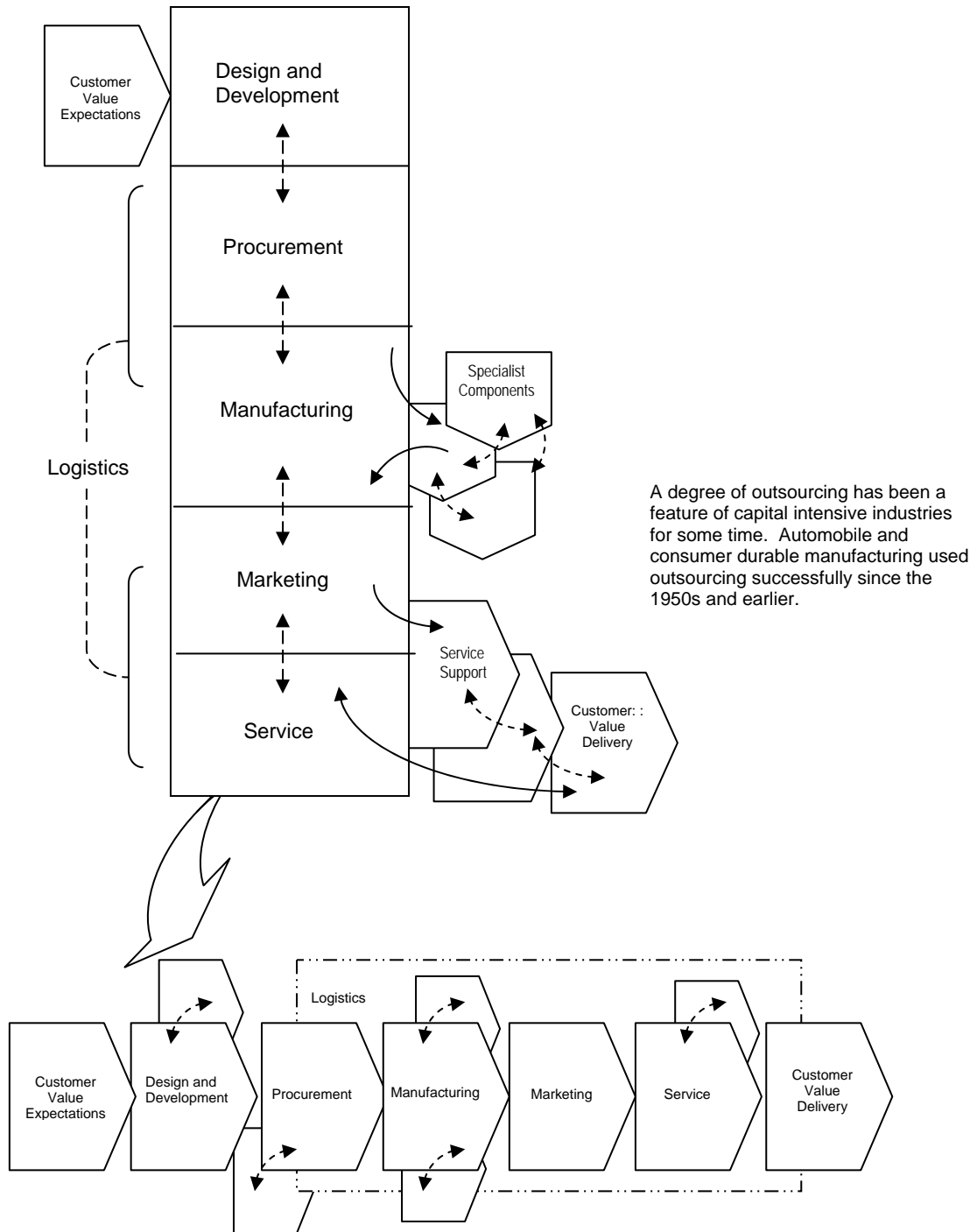
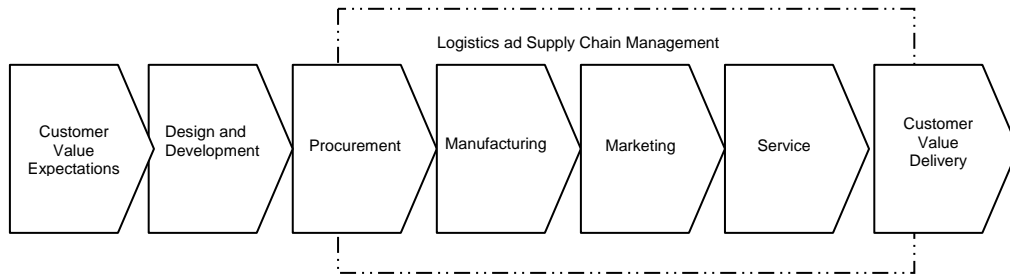


Figure 1: Vertical structures give way to virtual organisations in which partnerships based upon investment intensity and expertise are increasingly part of the business model

Figure 1 illustrates the change that has taken place. While Porter's value chain approach did not suggest that the vertically integrated structure was an essential feature there was an inference that was so. Proponents of the virtual model have adopted the view that a process perspective of the organisation be adopted and this will provide the opportunity to explore inter-organisational alternatives for delivering customer satisfaction. In addition

(it is argued) it moves an organisation away from the “silo” mentality in which functions in vertically structured organisations tend to operate independently.



In the “New Economy” model the role of Design & Development is to design products around standard parts and platforms and to design with production and service processes in mind – for example the use of a lower skilled/lower paid labour force. This ensures that more value is captured such that Manufacturing *becomes* Production: an Assembly Process

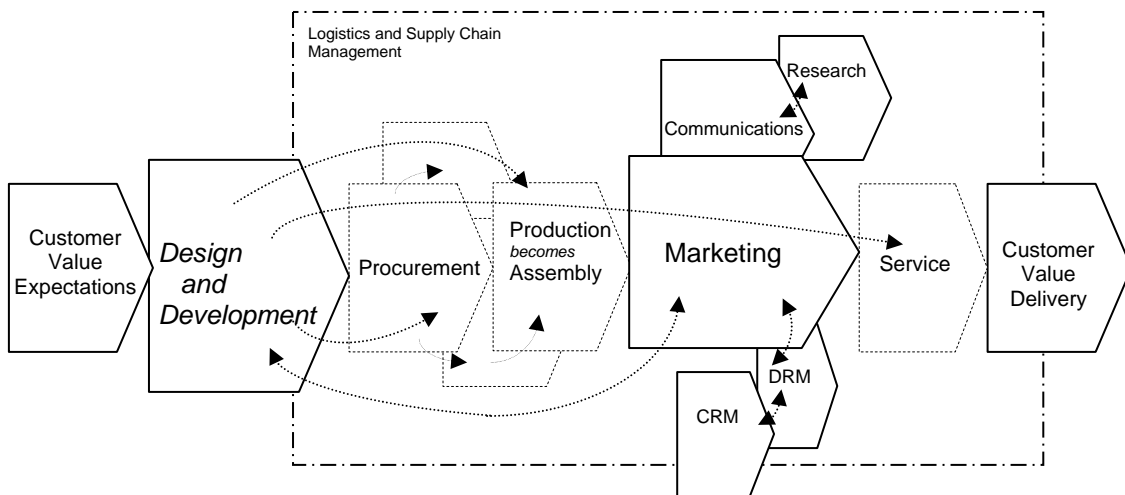


Figure 2: Organisations select the roles in the value chain that best fit their resource profiles; for example increasingly we see organisations focus on design and development and marketing and structure their supply chains around these specialisations

Many organisations ask the question: where in the value chain can the organisation capture more value (i.e. increase profitability and cash flow)? See **Figure 2**. They are seeking opportunities to exploit their specialist abilities or to establish themselves in locations where they perceive greater opportunity. The reason that these issues arise is due to *value migration*.

Value migration occurs as both economic and shareholder value flows away from obsolescent (and obsolete) business models. Slywotzky (1996) argues that new models offer the same benefits to customers but at lower cost by changing the model structure. This change often results in a restructuring of profit sharing throughout the business model. Uren (2001) quoted Schremp (CEO, Daimler Chrysler) who expressed the view:

“.....within 10 years the price of a car will represent only a quarter of the total value provided to a customer with the balance consumed in maintenance, finance and other services”. In other words the added value profile of the value chain changes.

2.1 Value migration has influenced the move towards value creation systems

Value migration (introduced earlier) is the shift of business designs away from outmoded designs toward others that are better designed to maximise utility (value) for customers and profit for the company. Slywotzky contends that business designs (similar to products) also have cycles and reach economic obsolescence. Customer expectations have a tendency to change over time but business model designs tend to stay fixed. By combining both, alternative added value structures may be evaluated.

A significant advantage of the value chain concept is that by using added value as a basis for assessing market opportunities and an opportunity to increase ‘value capture’ it enables an organisation to monitor *value migration* and to re-assess its involvement and location within the demand chain/supply chain (value chain) structure. Mark Levin, (Champion: 2001) who described how perspectives of value have changed in the pharmaceutical industry:

“Value has started to migrate downstream, toward the more mechanical tasks of identifying, testing, and manufacturing molecules that will affect the proteins produced by the genes, and which become the pills and serums we sell. At Millennium, we’ve anticipated this shift by expanding into downstream activities across several major product categories. Our ultimate goal is to develop capabilities and a strong presence in every stage of the industry’s value chain- from gene to patient”.

It follows that close monitoring of the value chain (discussed in the introduction above) identifies significant changes in value and value delivery opportunities. It also suggests that a fixed view of an organisation’s supply chain, and the organisation’s customers’ expectations could result in significant problems and financial difficulties.

2.2 The value chain: Integrated demand and supply chains

Supply chain management supporters have argued that the supply chain has attempted to meet all the changes identified within the new economy. *Supply chain management* has focussed on moving products and services *downstream* towards the customer. Typically the supply chain is coordinated by manufacturing companies or dominant resellers who use in-house manufacturing and distribution facilities to achieve market-based objectives such as market share volumes and customer penetration. *Demand chain management* changes the emphasis towards ‘customisation’, *responding* to product and service opportunities offered by specific customers or customer groups sharing particular characteristics. The preference is to outsource rather than own the functions and processes that facilitate and deliver value. Focus is on asset leverage and communication through distributed assets and outsourcing. *There is a large incentive to integrate supply and demand chains* - it provides new opportunities for creating (or adding extra) market value. Working both together results in more specific and manageable value propositions and increases the returns to the value-chain participants. There is an interdependent relationship between supply and demand: companies need to understand customer demand before they can manage it, create future demand and, of course, meet the level of desired

customer satisfaction. Demand defines the supply-chain target, while supply-side capabilities support, shape and sustain demand.

The differences between the demand chain led organization and the supply chain led organization are based upon emphasis. While supply chain management is to a degree customer focused the emphasis is on *efficiency*. Management concern is cost-led and attempts to provide an adequate level of service. The danger here is that customers may be 'aggregated' or fitted into categories that appear to be near enough relevant. Thus the link between supplier relationship management and customer relationship management is tenuous. By contrast the demand chain approach is a broader view of relationship management taking a view that the two overlap and that *effective* management is to integrate the two. If this is achieved the result is one in which the often conflicting objectives can be brought together more closely. Clearly there is evidence to suggest that:

Demand chain analysis is:

Developing an understanding of current and future customer expectations, market characteristics, and of the available response alternatives to meet these through the deployment of operational processes.

Operations response management is:

An operations response system/chain extends conventional supply chain management processes to include a wider range of responsibilities such as:

- Product-service specification and design
- Procurement, "production" management & inventory management
- Marketing and sales operations
- "Value delivery" distribution
- Customer services management

It is the efficient implementation of one of the alternative operational responses that will not only meet customers' expectations but also meets the financial objectives of the 'organisation.

Demand chain management is:

Coordinating the views of customers with those of the organisation to make feasibility and viability coincide.

The current attitudes in businesses suggest that customer led value generating systems need to be integrated and coordinated if an organisation is to be both *strategically effective* and *operationally efficient* and meet the challenges of flexibility, agility and lean operations.

This overall activity is illustrated as **Figure 3**.

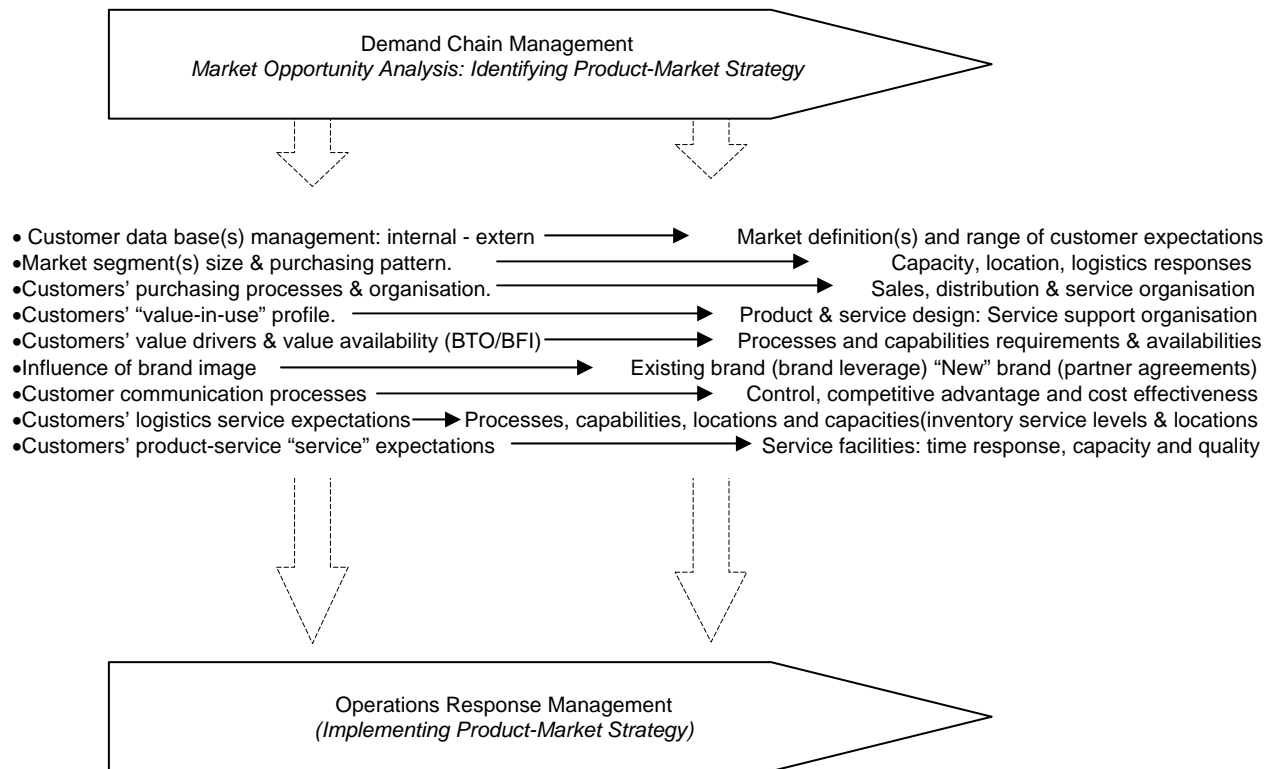


Figure 3: The demand chain offers an approach to value chain positioning decisions

By using *demand chain analysis* to identify customers' expectations *product/service profile(s)* of markets and their segments will emerge. This not only establishes the product and service features for customers but it also prioritises the important, or essential value expectations (or value drivers), the features that will at least guarantee the consideration of prospective customers. Following from this the organisation can develop a series of *product/service characteristics* that will form the basis of the value proposition or response to the customer. At this point it is likely that decisions concerning where within the overall industry value chain the organisation can be most successful. By *specifying the operations response*, the "ideal" response will emerge but this will be conditioned by the resources required for this to occur. It follows that there is a need to identify optional innovative responses, responses that offer the organisation the opportunity to maximise its share of market value. The 'innovative responses' can then be reviewed and, typically, this entails a review of the operational response tasks and identifying partner organisations capable of making those responses cost-efficiently. Thus the network based business model first identifies the resources required to meet the value offer, understanding and accepting, that it may not possess all or indeed any of the *assets, processes or capabilities* that will be required to compete successfully in the market. However the analysis does serve to identify a match that is necessary if a strong market response is intended. *Demand chain analysis* has explored and has ascertained, for example, the role of brands, innovation, and service response and identified the sensitivities of customer response to these and other product-service features. It also identifies structural changes within the industry by identifying the alternative value system structures that prevail, their relative success, and where added value is migrating within

the value systems. The operational response then determines the *production facilities and networks, market entry networks and the market management networks* that will be required for a successful response. A strategic response requires skilled integration and coordination of the resources regardless of their ownership and location. As already established all or some of these may be external to the company (possibly in an overseas location) and therefore may be accompanied with high levels of risk. As **Figure 4** suggests it is not unusual for ‘innovative responses’ to involve suppliers, customers themselves (eg IKEA), and even competitors (co-opetition) where manufacturing and logistics capabilities and capacities are increasingly leveraged.

The role of the individual firm within the industry value chain can be illustrated by **Figure 4**. Successful value chain partners work together with other partners each of who offer complimentary expertise – assets, processes and capabilities. In the example of Millennium, above, the CEO, Mark Levin has pursued the opportunities offered in a rapidly changing business environment by integrating the expertise of Millennium with those of other organisations. Millennium’s approach is one requiring constant appraisal of market opportunities and a clear knowledge of the current ‘worth’ of the firm’s abilities.

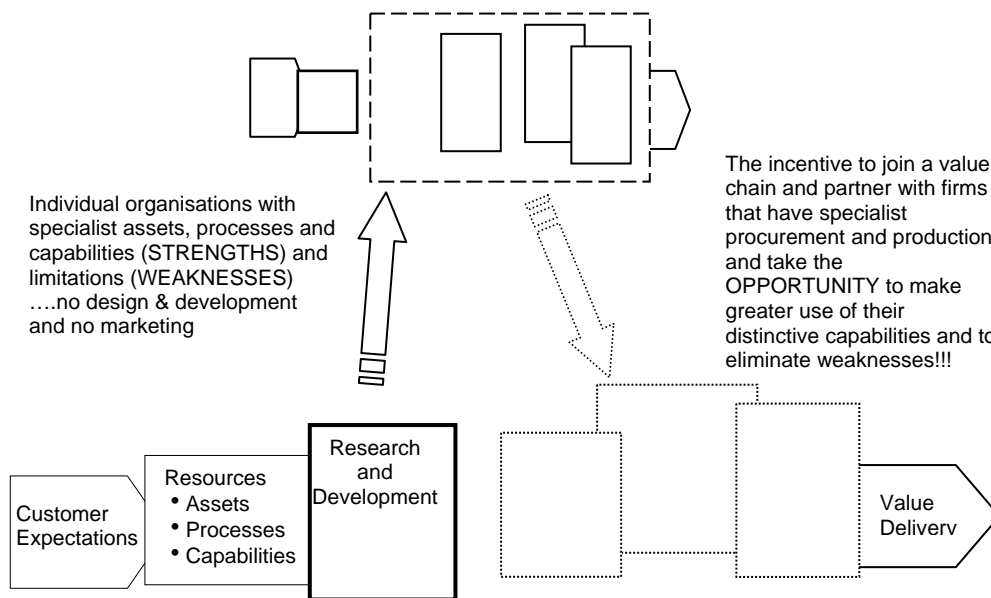


Figure 4: Integrating into an industry value chain

Figure 5 suggests a starting point. If the organisation is to identify with a role within the range of value chain processes it is sound business sense to establish itself in that role and to monitor potential competition that may attempt to undermine its positioning. This requires rigorous self analysis and takes a prospective view of product and process developments together with a similar long-term view of competitive activities. Often this suggests to an organisation that possibly due to value migration or perhaps an external shift in the industry characteristics due to changing technology, or may be relationships structures a company may consider it timely to shift its positioning within the value chain. Internal factors may also suggest this to the organisation’s management as the organisation develops new skills.

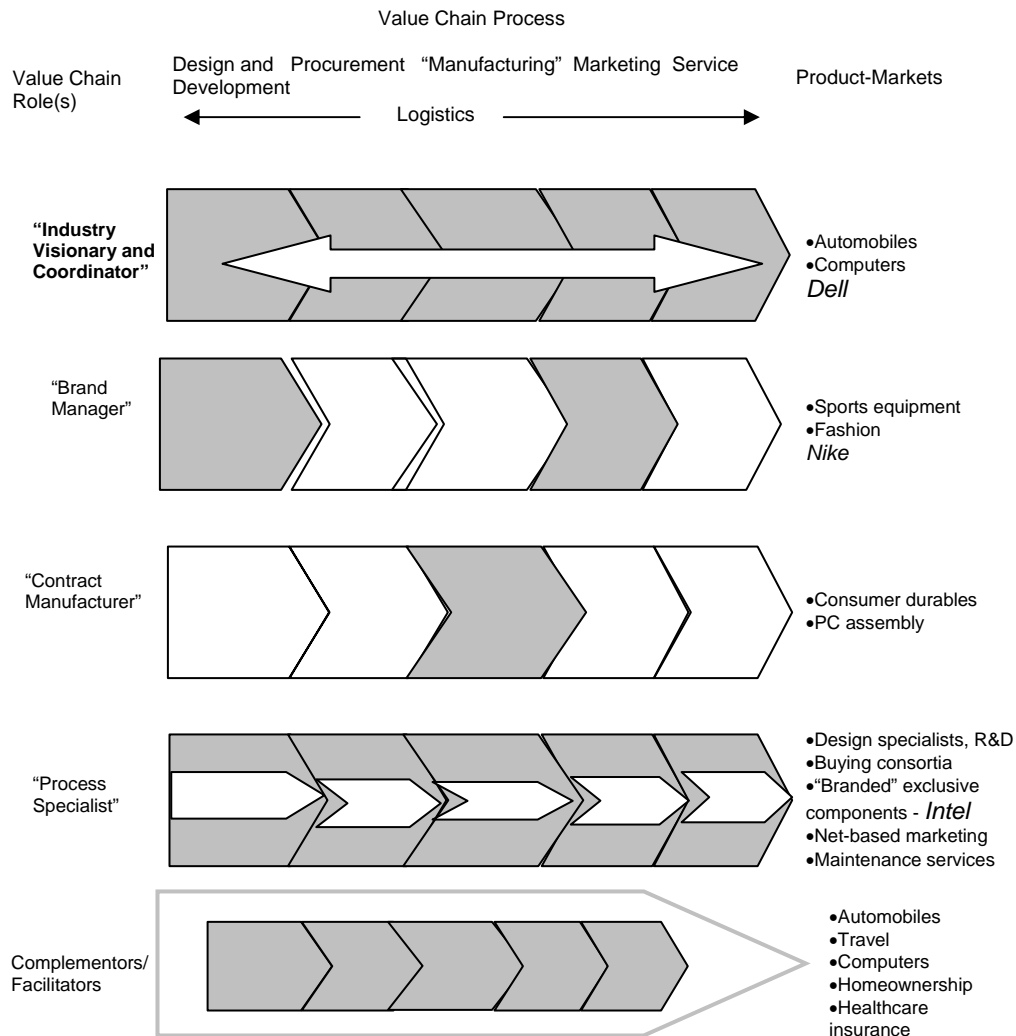


Figure 5: Positioning alternatives in the value chain

Each of these value chain roles brings a different perspective of the economics of production; the managerial skills that were required to manage scale have been replaced by the skills needed for integrating and coordinating inter-organisational activities.

3. A new role for logistics and supply chain management in the value chain

3.1 Logistics and supply chain management

Changes in strategic applications and organisational structures often require compatible changes in support processes and activities. While it has been argued that organisations should develop logistics and supply chain strategies it is more likely that success will be based upon a policy that integrates logistics and supply chain management into strategic decision making.

Before developing this argument we should remind ourselves of both concepts:

Logistics is the process of strategically managing the procurement, movement and storage of materials, parts and finished inventory (and the related information and cash flows) through the organisation and its marketing channels in such a way that current and future profitability are maximised through the cost-effective fulfilment of orders.

Supply chain management concerns the management of upstream and downstream relationships with suppliers and customers to deliver superior customer value at less cost to the supply chain as a whole.

The supply chain could also be defined as a network of connected and interdependent organisations mutually and co-operatively working together to control, manage and improve the flow of materials and information from suppliers to end-users.

Christopher M (1998), *Logistics and Supply Chain Management*, Second Edition, Pearson, UK

Given the more recent approach of many organisations, both logistics and supply chain management has evidenced a transition to asset “management” rather than “ownership” as the dominant business model. **Figure 6** illustrates this point. The value chain (value creation system) is essentially a series of processes rather than functions and unless detailed attention is paid to managing the stocks and flows of materials, information and cash transactions *and* the relationships between (and among) the partnership structures that make the structures effective and efficient the value chain/system will not survive. Business logistics management adds value by creating form, time, place, convenience and information utilities within the value system.

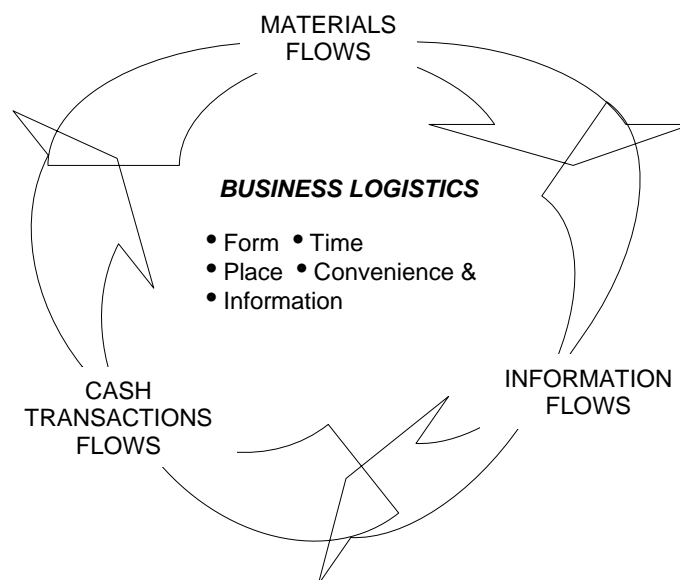


Figure 6: The basic roles of business logistics – creating value (utilities)

Christopher (1998) identifies the role of logistics in adding value. Christopher contends that managing lead times within the logistics pipeline is a process whereby procurement and manufacturing lead times are coordinated with marketplace needs, identifying the objectives of pipeline management as; lower costs, higher quality, increased flexibility, and faster response times. The development of virtual networks (the extended enterprise)

identifies another objective – *system transparency* – the requirement to provide all stakeholders with accurate and timely information.

The attraction of the virtual network system is that they identify alternative structural formats for responding to the three principle value drivers; time, availability and quality by taking a much broader perspective of “organisation”. **Figure 7** explores this proposition by considering organisation as an intra and inter-organisational network that includes the customer as a component within the structure. A number of organisations have developed interesting and effective business models around this concept. Dell has revolutionised computer distribution by using the internet as a means of direct communication with customers and suppliers thereby reducing overall lead times. IKEA create value by working with suppliers to manufacture their products such that the production process (creating form utility/value) and distribution process (time, place and convenience utilities) can be completed by the purchaser. Information is an important input throughout the implementation of the process by managing volumes and product quality with suppliers and availability and communicating product construction information instructions to the end-user customers. In both these examples the organisations manage their networks based upon effective and efficient management of logistics flows and relationships.

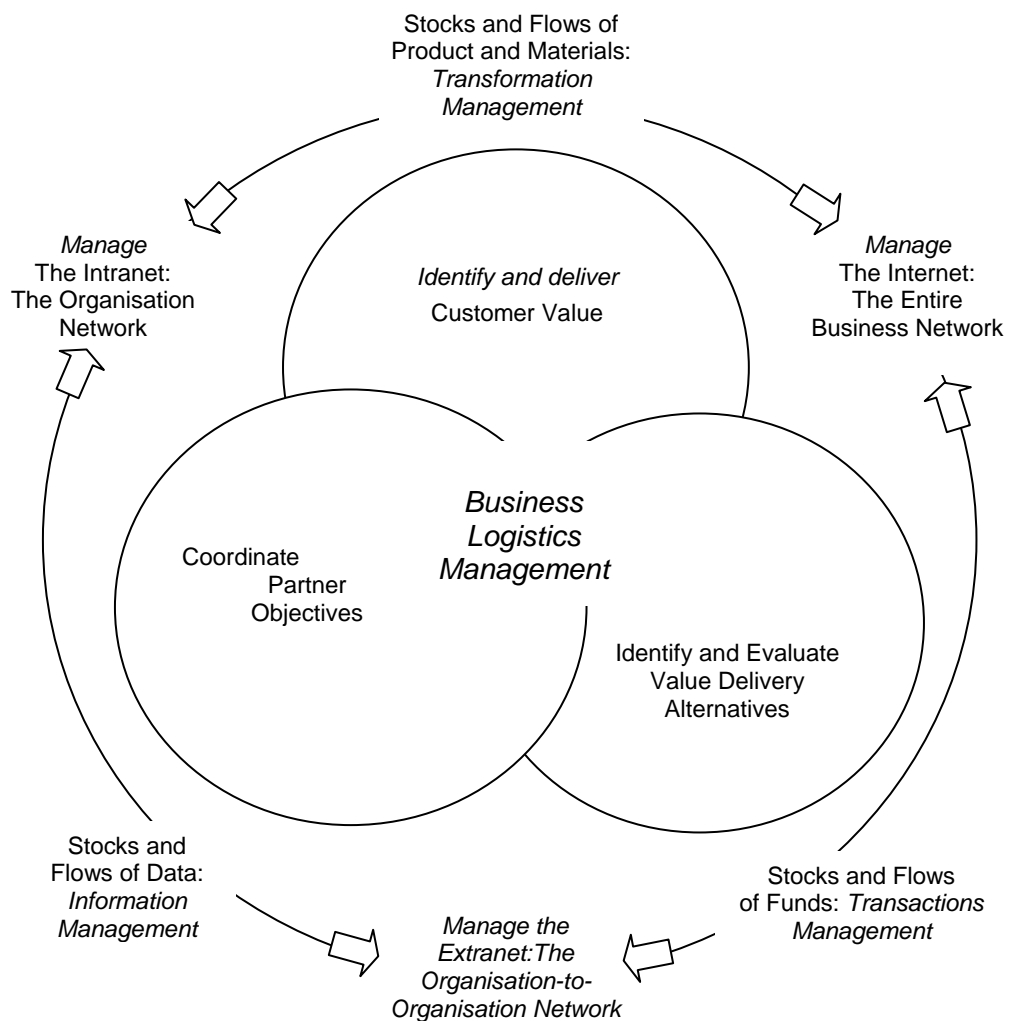


Figure 7: The logistics of the extended enterprise

Figure 7 identifies the role of business logistics in the virtual network. Its primary responsibility is to ensure the integration and coordination of the stakeholders' interests i.e., the customer and the partner organisations (and their shareholders or investors); this effectively requires identification and an evaluation of all of the economically viable value delivery alternatives available. The process evaluates each of the strategic (cost-effective) and operational (cost-efficient) value delivery alternatives available. By using the network structure an optimal network is identified; one in which customer and partner satisfaction is achieved. By evaluating the objectives of all stakeholders *and exploring all economically viable* pathways to the customer against a set of qualitative and quantitative criteria a 'solution' can be found. As suggested by **Figure 7** the network that eventually is constructed will evolve from a total network based evaluation of alternative ways and means of managing the logistics of the stocks and flows of materials, information and cash flows throughout the network.

3.2 A corporate role for logistics and supply chain management

It becomes clear that there is an important corporate role for logistics and supply chain management. **Figure 8** identifies policy areas for input by logistics and supply chain management.

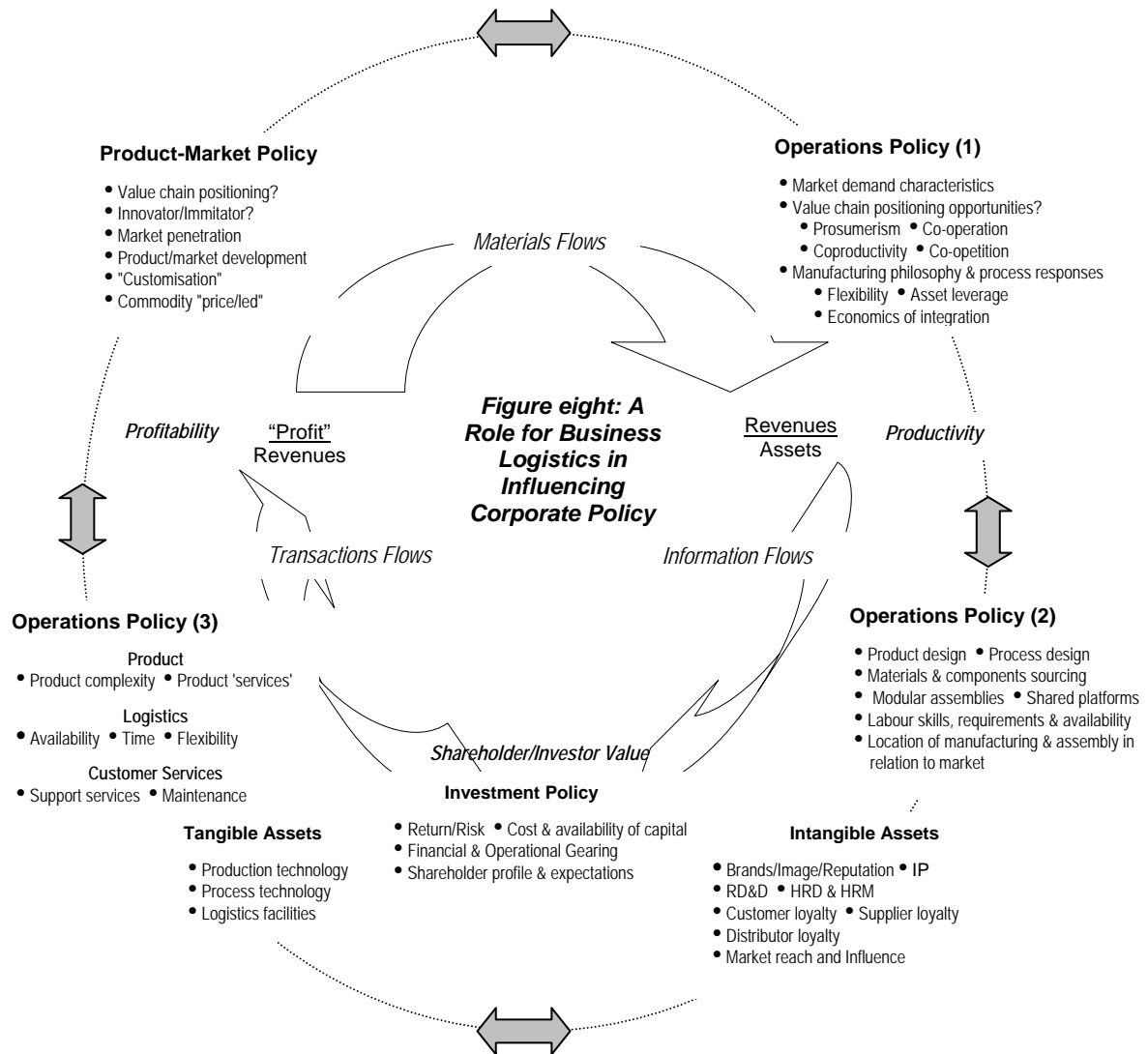


Figure 8

Figure 8 extends the argument made by **Figure 6**. The notion of financial performance has been added to the proposal made by identifying the profitability, productivity and shareholder/investor performance expectations that are required. A number of policy issues that have an impact on overall financial performance are also introduced these are; product market policy and a range of issues under generic headings of operations policy, together with investment policy concerns. A review of these topics will lead to the conclusion that they are each influenced by the logistics and supply chain management characteristics identified earlier; i.e. managing the stocks and flows of materials, information and cash flows.

4. The logistics of operations and manufacturing management

4.1 *Process rather than functional management*

More recent views of the value chain model suggest the importance of taking a *process* based perspective of the organisation and extends this with the view that processes are not simply *intra-organisational* but have become *inter-organisational* and often become *intercontinental!!* Value chain analysis identifies the core processes and core capabilities involved in meeting the essential corporate and customer value drivers.

"A core business process "creates" value by the capabilities it gives the company for competitiveness". Johansson et al.(1993).

Core business processes are the processes identified by the organisation as being central to its strategy for competitive advantage. Normann (op cit) suggests that the core business process of a company in the long term is to form new "dominating" ideas. There is a similarity here with Porter's argument: for long-term success. Long term the company requires a strategy for value delivery that not only offers competitive advantage through differentiation but one built around a core process to renew (or perhaps form new) 'dominating' ideas - the drivers of long-term competitive advantage. Normann contends:

"No other process in any organisation is more fundamental in the long-term than this renewal of the dominating ideas, this re-appreciation of an organisation's identity and the way of manifesting it, in the face of environmental change".

Hammer (2001) argues that as businesses become accustomed to the *customer economy* 'process thinking' becomes essential. "In order to achieve the performance levels that customers now demand, businesses must organise and manage themselves around the axis of process; moreover, they must apply the discipline of process even to the most creative and heretofore most chaotic aspects of their operations". And: "...processes are what create the results that a company delivers to its customers". Hammer continues by providing a *customer economy* definition of a process. He offers:

"... an organized group of related activities that together create a result of value to customers'.

Hammer's discussion of this definition suggests increasing opportunities for the virtual organisation. He establishes a process as a *group* of related activities that work *together*, pointing to the fact that value is created by the entire process. It is the result of 'value production and coordination'. Activities are *related* and *organised* with no irrelevant activities and performed sequentially giving some structure to the process and requiring process management. Effective process management is *result* oriented: results are reflected in end-user satisfaction, hence processes should be customer oriented. **Figure 9** demonstrates how this may be achieved using the basic value chain processes of identifying, creating, producing, communicating, delivering and servicing value.

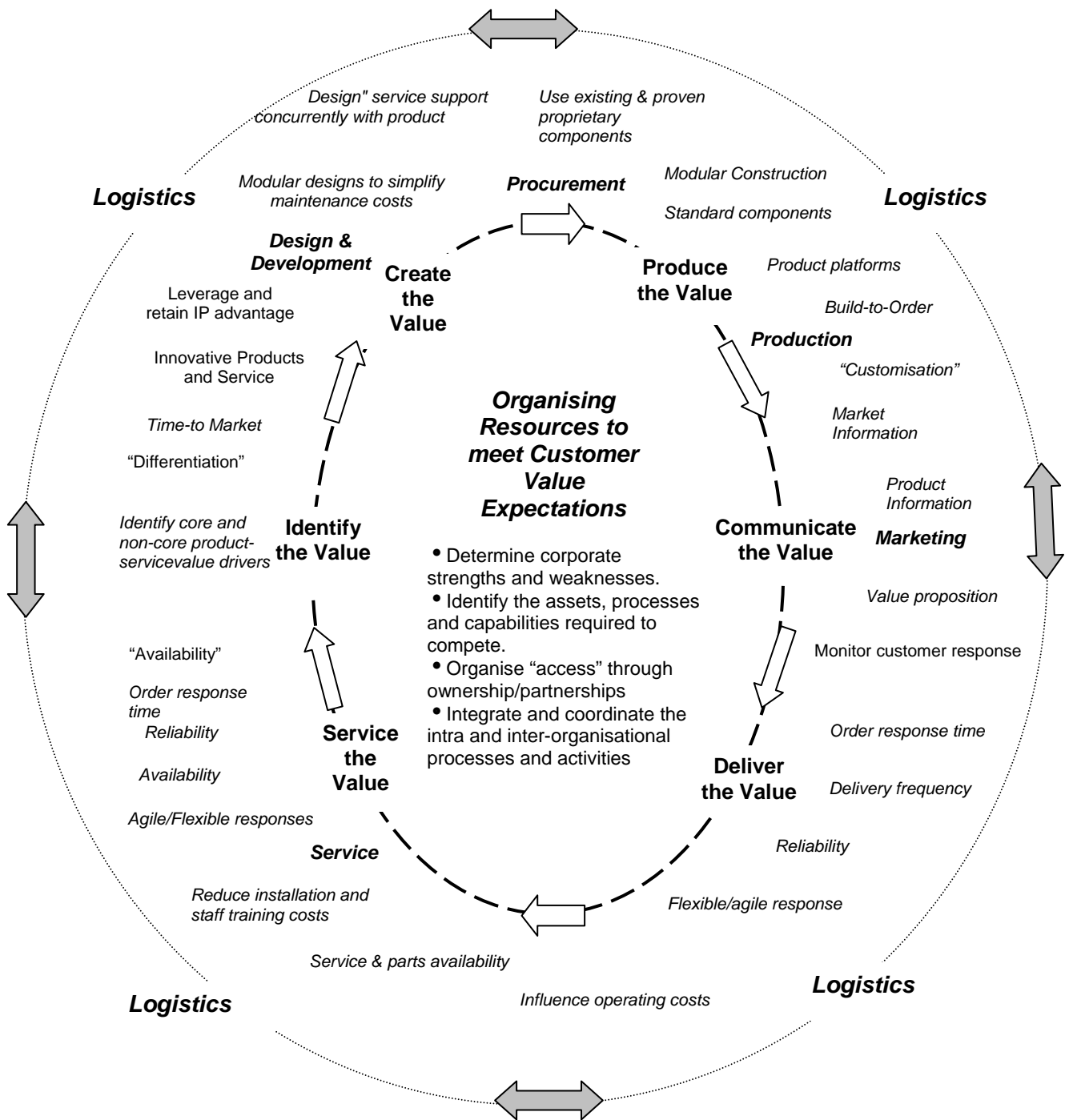
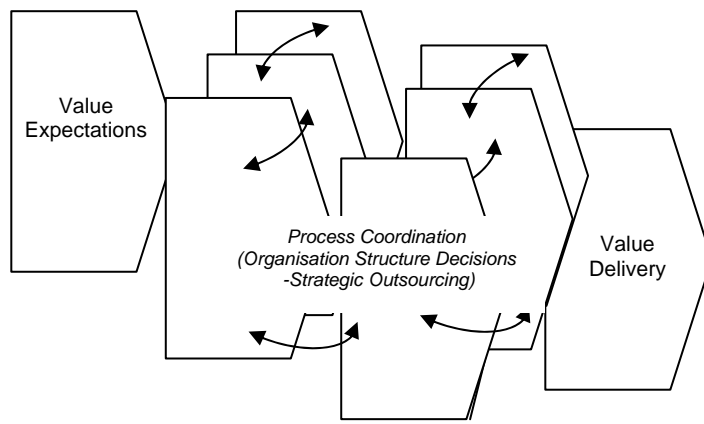


Figure 9: Identifying customer facing processes and process alternatives to adding customer value

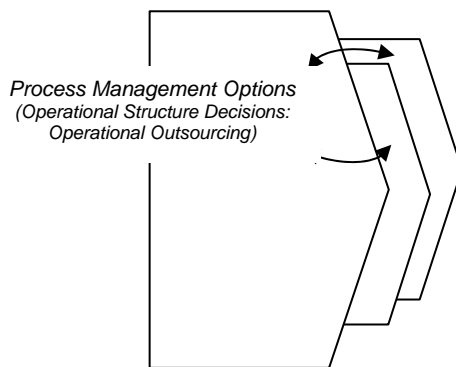
Figure 9 suggests an important role for logistics in the integration and coordination of the customer facing processes that are important to delivering customer value. It was suggested earlier (Figure 5) that the value chain/value system network approach has prompted organisations to reassess their capabilities and process attributes with a view to repositioning themselves within their respective industry value chains. The focus on processes rather than functions simplifies this approach as it questions the role (and therefore the role, even the existence) of functions within the organisation.

A strategic perspective is taken by Armistead et al (1999). The authors identify themes “associated” with business process management. Strategic choice and direction suggests that because an organisation cannot pursue every opportunity it makes choices, or trade-offs and these determine the resource patterns of organisations and, eventually the development of core competencies. These, in turn, lead to competencies that influence subsequent strategy. Strategic business process management forces companies to “examine their form and structure” having an influence on boundaries, structure and power within organisational design. An important component of the authors’ model is the market value chain which “links the stages which add value along a supply chain”. They suggest that *within* an organisation the market value chain is taken to be the conceptualisation of the core processes and activities which represent the organisation in process terms: “They capture the activities which start and end in the organisation and link with other organisations in the chain”. They further suggest that the market value chain reinforces the resource-based view of the organisation because it forces the identification of core processes from which core competencies and competitive advantage emerge. Performance management is another perspective of strategic business process management which “relies on the management of resources and on a series of measurement systems”, without which progress towards goals and any necessary corrective action is not possible. Organisational co-ordination occurs internally and externally (i.e.; with suppliers and customers). This is particularly “pertinent as the boundaries of internal processes become more ill-defined”; it could be argued that it is even more important for the boundaries between value chain organisations (such as the relationship between customer and supplier). This perspective adds emphasis to the importance of relationship management. The authors also identify knowledge management as a component of their model. Business process management enhances organisational learning and knowledge management. It: “provides a framework for organisational learning and can incorporate the management of knowledge”. Clearly these are determined by the specific application but suffice it to say they are essential to the successful performance of the value chain.

Figure 10 reflects the approach now being taken by what may be labelled “new economy” or “smart manufacturers”. One of the companies cited in Lloyd’s report *op cit* is owned by Carlos Broen whose Ingleburn factory is supplying tools to Boeing for use in the manufacture of the carbon fibre wings of the Boeing 787 (The Dreamliner). Broen comments: “The world of manufacturing has changed. Anything to do with non-sophisticated, value-added manufacturing has moved offshore to cheaper labour markets. The companies that survive will be those dealing with intellectual property or knowledge.”



Process Coordination: the economics of integration and coordination



Process Management: balancing the economics of IP and scale. Design and Development protects IP by ensuring that product designed around a manufacturing process that retains the manufacturing of exclusive core product and process knowledge based components in house while outsourcing the non-core elements of the product to realise economies of scale. It is due to the impact of the economies of interactions that the options can be identified, implemented and managed

Figure 10: *The value chain approach enables specialisation and offers the opportunity to exploit intellectual property with relatively low commercial risk*

Developments such as these offer opportunities for logistics management. For “high-value low volume” companies there are new expertise requirements. It will be recalled (**Figure 6**) that logistics management concerns the effective and efficient management of stocks and flows of materials, information and cash flows. We are now seeing the importance of the selective application of these skills in quite different industry situations. The “high-value low volume” companies will require an emphasis on the confidential management of the transfer of information flows while the “high volume- low value” organisations will need to focus on the cost and time efficient management of materials flows and of transactions flows as cash management becomes increasingly important in industries in which margins are constantly under pressure.

Figure 11 concludes this section with examples of Australian organisations that have repositioned themselves in their respective industry value chains

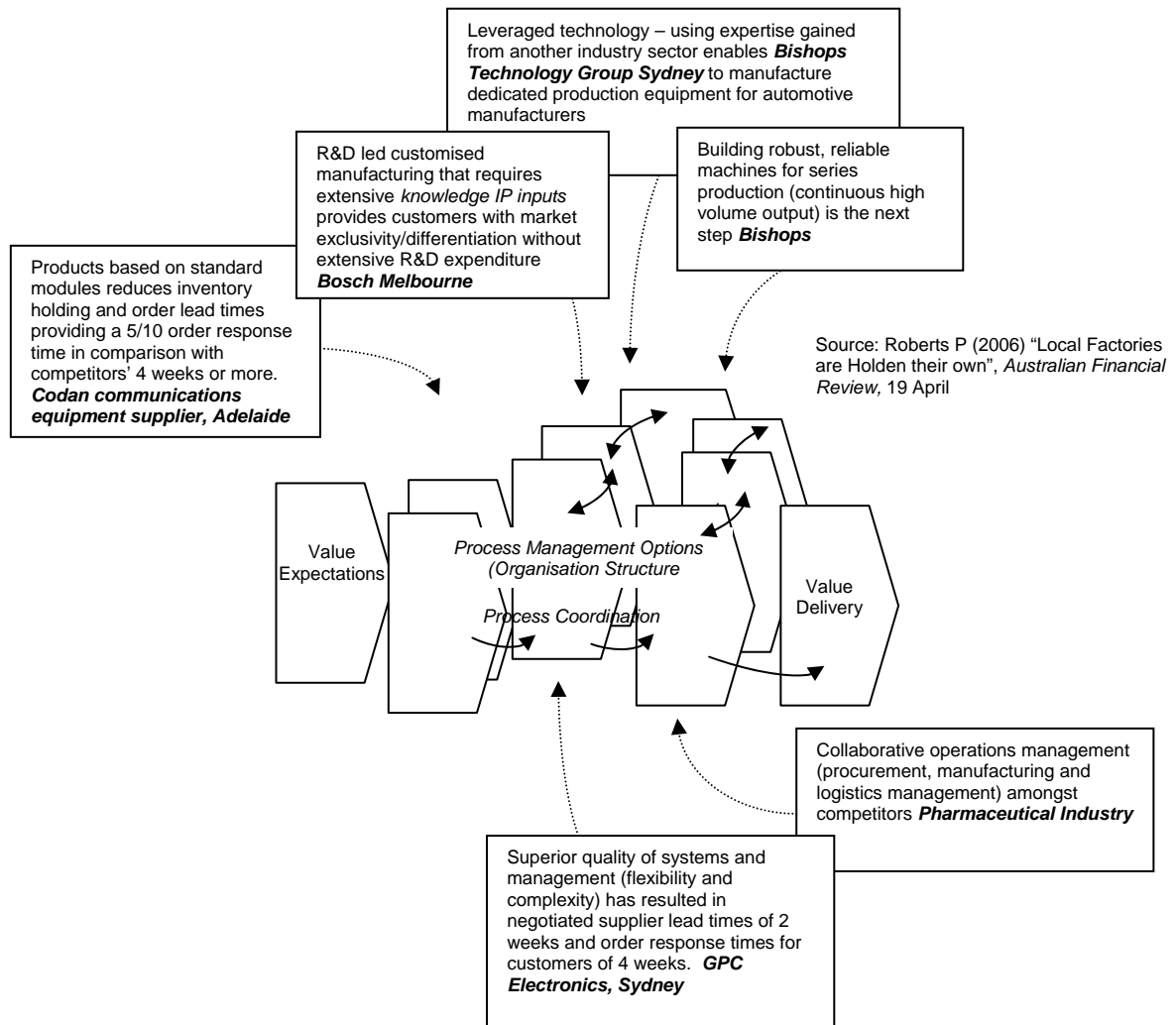


Figure 11: Examples of Australian companies have adapted to the value chain approach

5. The logistics of financial management

The preceding paragraphs have suggested the importance of understanding the logistics/finance interface. **Figure 12** is a financial model of the firm based upon current thinking concerning long and short-term performance and competitiveness. The model identifies where competitive necessity is essential, where competitive advantage is desirable and where sustainable competitive advantage may be developed. The model emphasises those resources that have an impact on performance and the organisational structures and systems that are relevant. The long and short term performance measures are cash flow based and therefore will be influenced by logistics management decisions. There is logic in this proposal; as the dominant business model is likely to be a virtual structure (or at least contain a number of virtual components) free cash flow is a more logical measure than aggregate profitability.

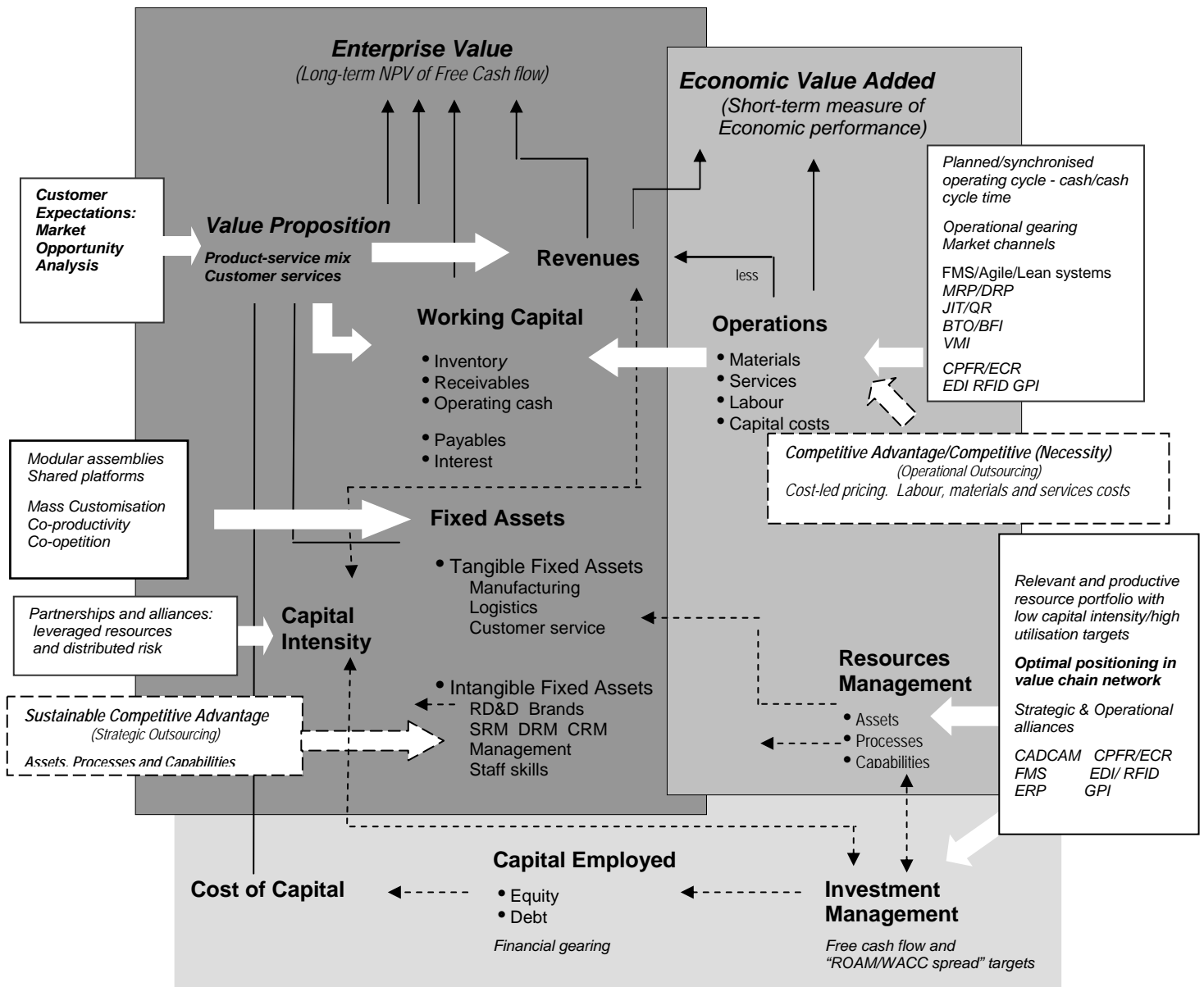


Figure 12: A resource based view of organisational performance identifying a role for logistics decision making

Free cash flow can be planned and monitored in a number of ways. The conventional accounting method is to add depreciation back to operating profit; however this is primarily a method favoured for taxation reporting rather than for strategic and operational planning. An alternative approach is one that reflects the conventional cash flow components but does so in a more easily defined manner. **Figure 13** identifies four decision making points and facilitates decision making among alternative options at each stage; it also encourages a scenario approach by suggesting that “what if?” questions should be asked of each of the other decision making points. For example, a decision to outsource manufacturing and distribution completely will clearly have implications for the fixed asset requirements (*cash flow from assets*) and for entry and exit costs (*strategic cash flow*) as well as equity and debt funding.

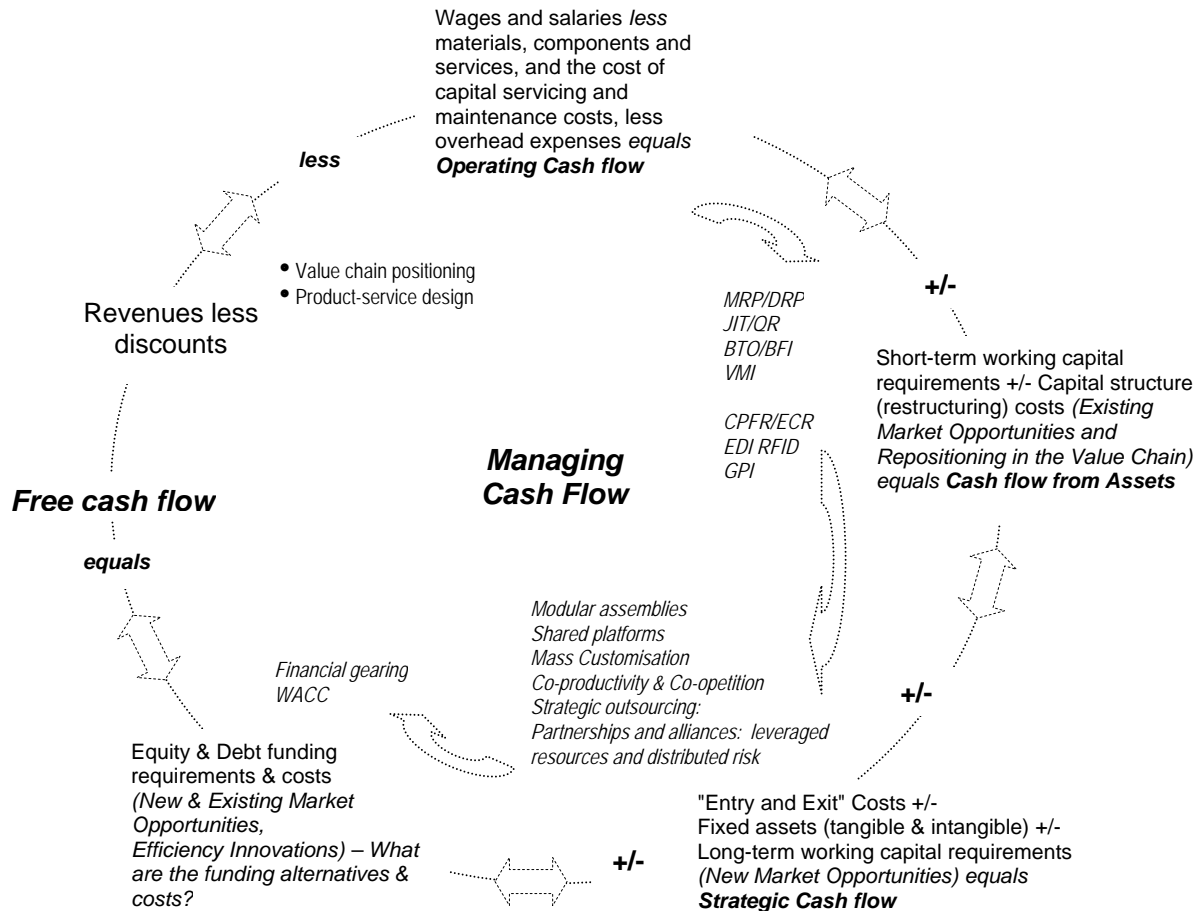


Figure 13: Logistics decisions have an impact on cash flow performance

Cash flow is a common denominator across business organisations and is one of the parameters that can be measured relatively easily (provided transparency has been agreed) and, as **Figure 13** illustrates can incorporate specific organisational features. One aspect of the virtual business structure is that it encourages organisational and process innovation. Typically we see a number of partnership structures between suppliers and customers that were not usual. For example, terms such as *prosumerism* – the involvement of consumers in the design of products (a creative role that results in products that meet *specific needs* of customers). *Co-productivity* is a more operational role by suppliers, distributors and customers in which they undertake tasks that hitherto were the role of other channel/chain participants. *Co-opetition* describes the situation in which competitors work together to meet individual objectives using mutual facilities.

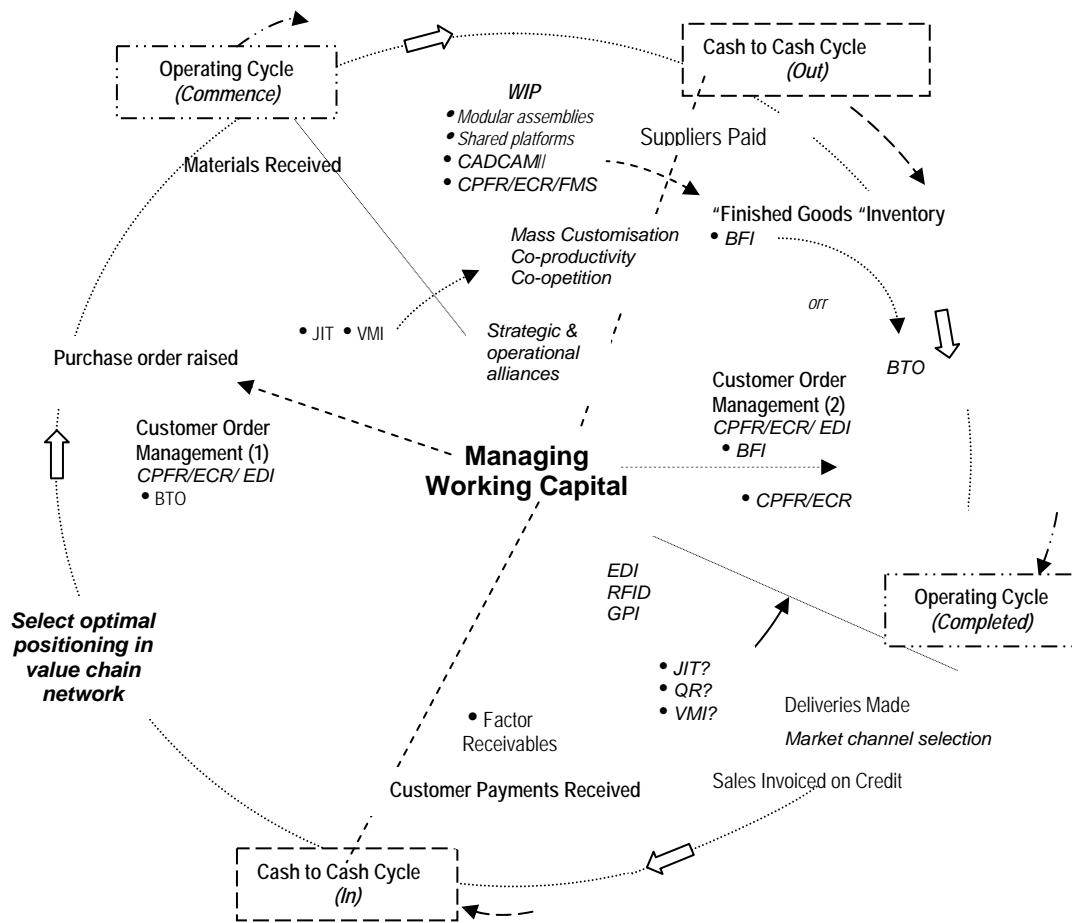


Figure 14: Planned/synchronised operating cycle - cash/cash cycle time

Figure 14 draws attention to a topic that is becoming increasingly important to corporate management and it is one that can be influenced by logistics and supply chain managers; the cash-to-cash cycle. **Figure 14** illustrates the concept. The diagram shows two important cycles, the *operating cycle* (the processes and time involved in adding form, place, convenience (and time) utility by the organisation. It is a measure of the time taken to convert raw materials into usable products and to deliver these to the end-user customer. It also shows the *cash-to-cash cycle* (the time that is taken between paying suppliers and the receipt of customer payments. Ideally these should coincide but this is an unrealistic expectation: however as the diagram demonstrates they are linked. As soon as materials and or components are transformed into useable product-services they can be sold and the cash paid to suppliers replaced.

Figure 14 identifies possible processes and methods by which both cycles can be managed in order to shorten the period during which the business is required to cover its cash flow requirements. In manufacturing both time and costs can be reduced by designing products around “platforms” that are shared by a product group. The automotive industry is an example of the advances made with this technique. Some distribution examples are; the use of EDI (electronic data interchange), RFID (radio frequency information data – machine readable chips inserted into/onto products and packaging) and even GPS (global positioning systems) to track containers. The purpose of each of these is to increase the accuracy (and reduce the time) of data flows and to add

to the transit transparency of product and materials movements. CPFR (collaborative planning forecasting and replenishment) and ECR (efficient consumer response) systems both aim to reduce the level of inventory holding by increasing the accuracy of system data flows and reducing the time required to transfer data and inventory. Both are dependent upon close cooperation of supply chain members.

Another method of reducing inventory costs (and this includes wastage as well inventory levels) is to adopt a postponement strategy (pull versus push strategy). Postponement involves delaying final production of products until firm orders are received. This also maintains response flexibility. A well known example of the use of postponement is provided by Dell who only move towards a completed product after an order has been received *and* paid for; strategic partnerships are essential for the effectiveness and efficiency of the process.

6. The logistics of manufacturing *

Figure 8 (a role for business logistics in influencing corporate policy) identifies a corporate coordinating role for logistics management. The increasing dynamics of competition based upon “time” and financial performance places a responsibility on logistics management that seeks products and materials very much in the “right place at the right time” but gives added emphasis to “in the right quantities and in the right “state””. The issue here being that the huge investment now required in developing capital equipment, such as aircraft, necessitates the integration and coordination of the overall value chain (i.e. that of the assembler of the final product) with the value chains of numerous suppliers.

An example of the current role of logistics management is provided by the approach by Boeing to the development and production of the 787 “Dreamliner”; an aircraft consisting of thousands of components and one of the biggest features in the manufacturing processes of Boeing, or in the aircraft industry, is that the majority of components are outsourced from different suppliers located in different countries.

Figure 15 shows the globally distributed innovation network of Boeing. In all, approximately 3 million square feet of new factory space is being built at 135 sites in two dozen countries around the world to support manufacture of the 787. Boeing performs about 35 percent of the actual fabrication work on the aircraft focussing on those things it does best; large-scale systems integration, lean and effective global design and production, working with exotic metals (titanium and its composites), and interpreting the needs of the airline industry. This approach helps to distribute both the risk and cost of doing business (Cort: 2006).

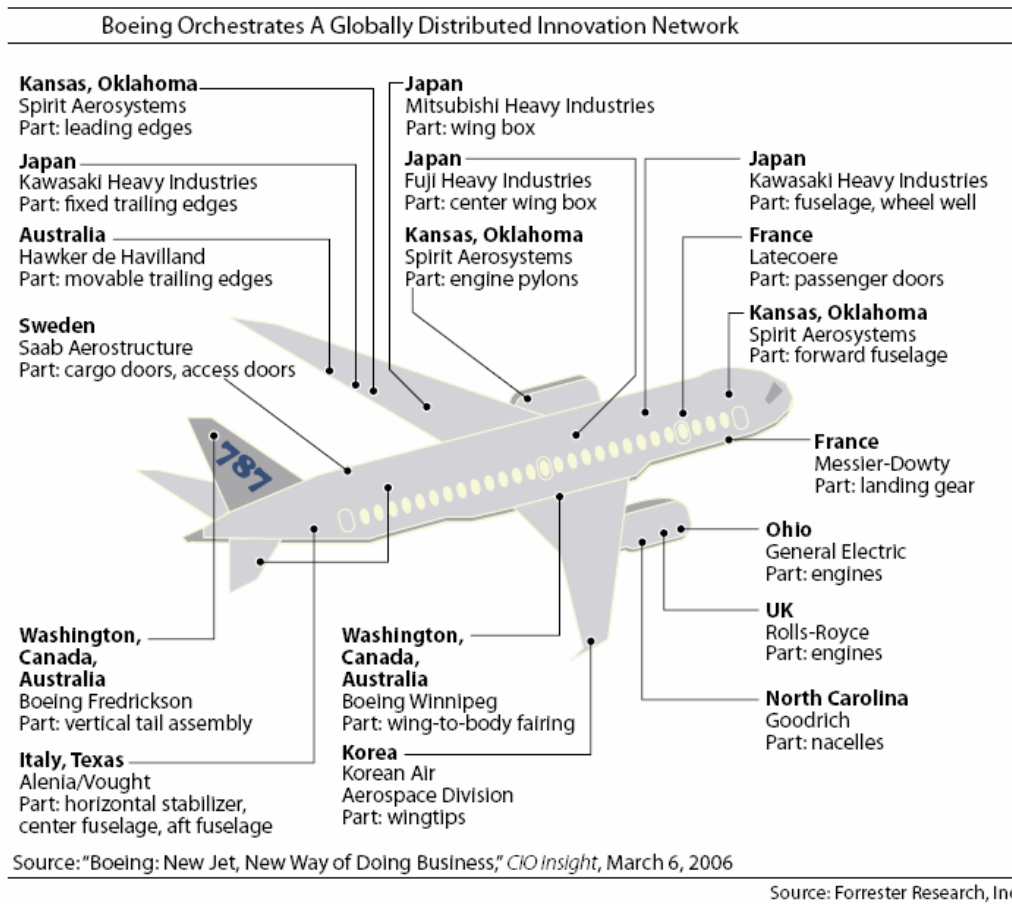


Figure 15: Boeing orchestrates a globally distributed innovation network

Boeing conducted a "virtual rollout" of the 787. By taking computer aided design beyond the aircraft itself, they modeled the manufacturing process, step-by-step and end-to-end in software. The 3D-based simulations of production processes have enabled Boeing and its partners to optimise the Dreamliner production system and avoided the costly late-stage errors that can occur with untested designs and production planning (Wikipedia, n.d.).

The paradigm shift in Boeing's manufacturing processes resulted in the evolution of a new supply chain network and logistics system. Therefore, the management of transport of outsourced components from different countries requires dealing with new challenges in comparison with the previous transport methods that were predominantly within the U.S. There are two key issues, cost and efficiency, in terms of the relationships between Boeing's manufacturing processes and logistics systems. Boeing has now adopted new supply chain management practices, whereby larger-sized aircraft parts (that have already been assembled by suppliers) are delivered to Boeing facilities rather than small components, the previous logistics systems may not have been able to transport them in a cost-effective way.

Since the jumbo jet 747 was firstly introduced in 1968, it has dominated the twin-aisle and long-range market for more than two decades (Lam, 2005). Order by channel, order fulfilment, delivery and "after-market service" constitute the supply chain network of the 747. Order fulfilment is the core part of the whole supply chain consisting of numerous stages from design, procurement, manufacture, and transport to assembly. For the 747-product group, Boeing uses a vertically integrated structure. The company performs its core activities in-house and only outsource non-core activities to other suppliers

(Harrigan, 2006). **Figure 16** illustrates how the suppliers work with Boeing in the supply of parts and componentary for construction of the 747. Most of the parts that Boeing directly contracts are delivered to Boeing facilities. The company performs the design, engineering, manufacturing and assembling of these parts. Very few components such as subsystem and accessories are delivered to other suppliers' facilities (Lam, 2005). After components are completed, they are delivered to Boeing's facilities for final assembly.

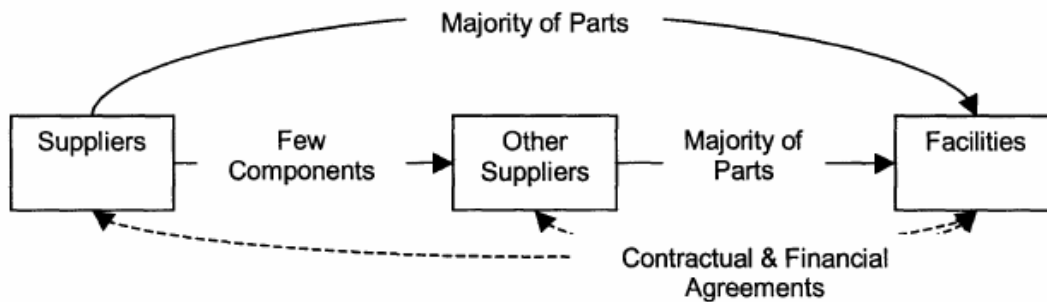


Figure 16: The Boeing 747 supply chain

Source: Lam, R.Y.Y. 2005, Designing and Implementing a New Supply Chain Paradigm for Airplane Development. Archives. Massachusetts Institute of Technology.

The 787 Dreamliner development program required new business processes and systems to be put in place; significant changes have occurred in the second part, order fulfilment. Boeing has revolutionised its way of doing business with its suppliers and has executed a new partnership structure in the 787 program.

Boeing uses a combination of vertical and horizontal structure for the 787. The Company retains much of the expertise of all levels of production within the organisation. However, Boeing now collaborates with its partners at several stages of design and production (Harrigan, 2006). **Figure 17** shows the new partnership structure for the 787. Boeing has reduced the number of its suppliers and selected some key partners as *tier one suppliers* to manufacture more complex products. In the new supply chain, they are considered to be an extension of Boeing's internal processes. *Tier two suppliers*, that used to supply directly to Boeing, are now supplying the tier one suppliers (Manufacturing and Business Technology, 2007). Traditionally, the majority of parts contracted directly by Boeing are delivered to Boeing facilities. Now, they are delivered to the key partners' facilities. These partners are responsible for all the design, engineering, manufacture and assembly. After these large parts are completed, they are delivered to Boeing facilities for final assembly. By doing this, Boeing has largely reduced company owned component inventories and the parts to be assembled in Boeing's facilities. Further, it has improved cash flow through postponement of inventory acquisition.

For 787 customers, Boeing will provide the same after-market services as it offers for the 747. Additionally, the company has also established a special maintenance program, called GoldCare. Under GoldCare, Boeing delivers maintenance, engineering and spares logistics tasks within a predictable per-flight-hour cost. GoldCare can transform airplane-operating data into actionable information, which can be shared by operators, suppliers and maintenance providers. This will help Boeing largely improve efficiency and airplane dispatch reliability and availability (Boeing, 2007). This programme is shown as

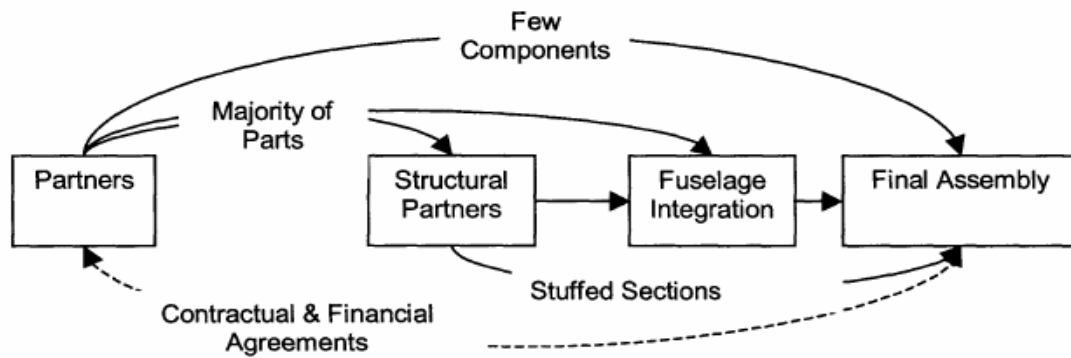


Figure 17: The Boeing 787 supply chain

Source: Lam, R.Y.Y. 2005, Designing and Implementing a New Supply Chain Paradigm for Airplane Development. Archives. Massachusetts Institute of Technology.

When comparing Boeing's traditional supply chain and the 787 Dreamliner's manufacturing supply chain, the notable difference is the significant management role Boeing plays in the entire supply chain. It is no longer a manufacturer but also a high-end systems integrator. Instead of positioning the supplier relationships at an arm's length, Boeing is attempting to engage its major suppliers as partners. The key factors of realizing such a relationship are a real-time, open and honest communication, mutual respect and shared goals which can move Boeing and its extended supplier family to a higher level of performance. Partners get involved earlier and take more responsibilities for the major tasks, including design activities. Boeing is building long-term strategic relationships with its core supplier base consisting of several companies which provide with structure, system, interiors and raw materials etc. Such a supplier base provides all partners an interface to work and solve problems together (Avery, 2006).

In order to involve more excellent suppliers and keep the current key suppliers, Boeing takes the Supplier Performance Measurement (SPM)' as a standard in selecting and measuring suppliers' performance. Each partner is ranked as per the five colour-coded standards; the top ranking being gold, followed by silver, bronze, yellow and red. The suppliers ranked red are the unsatisfactory suppliers who clearly fail to meet Boeing's expectations while the gold suppliers are the exceptional suppliers, exceeding expectations. Such measurement is not only a way to provide the standard, but also more often than not a method of motivation. Boeing's first UK Gold Supplier, one of only three European companies, and 20 elite Gold Suppliers globally in 2006, was MB Aerospace. This award highlights and recognises a supplier's commitment to excellence and further strengthens their long-standing relationship with the Boeing Company (Aerospace, 2006).

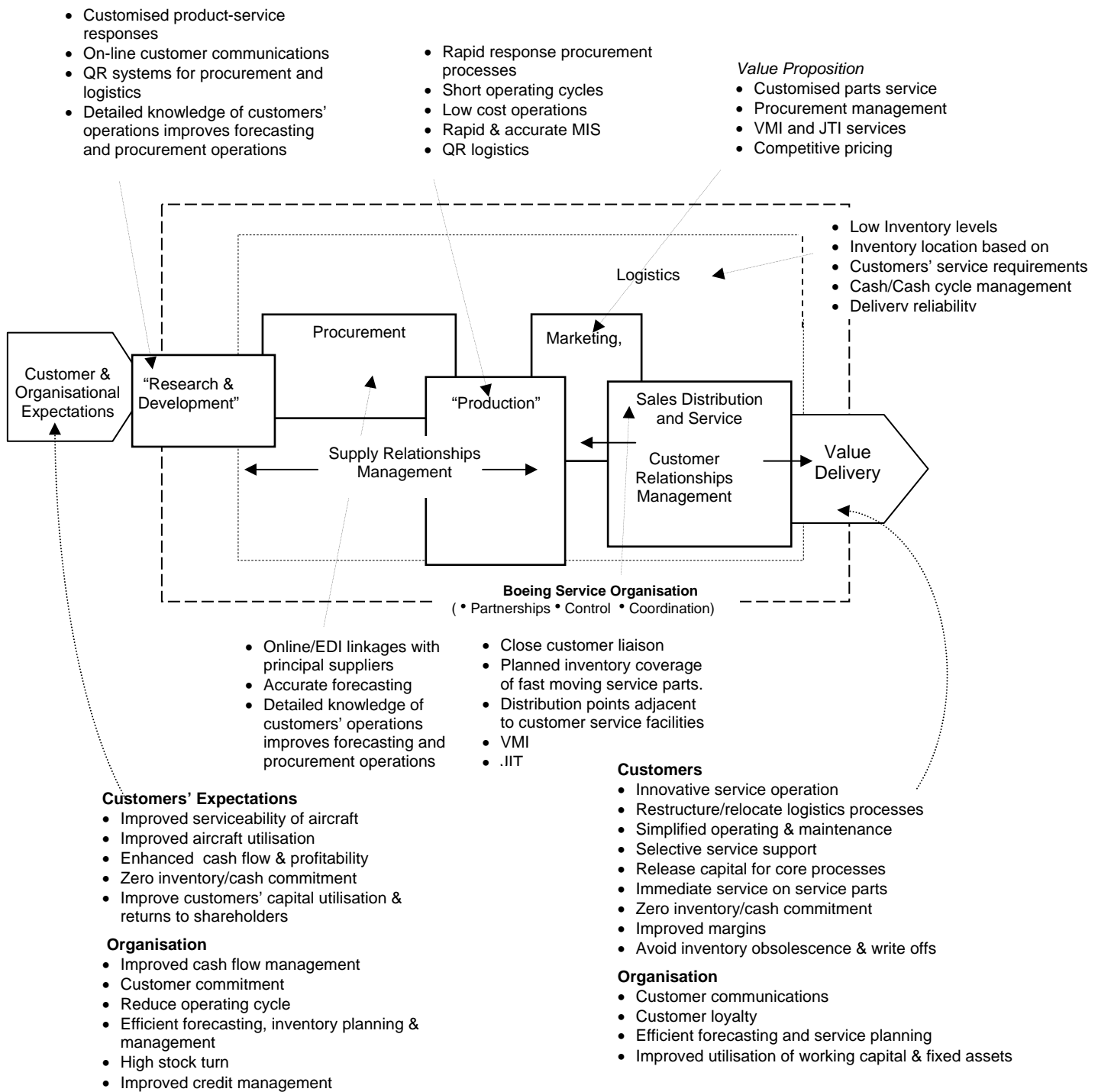


Figure 18: Boeing service organisation business model

* The contributions in this section of Xiaoliang (Ronnie) Fu, Ting Xu, Vellore Ranaganathan Sanjeer, Haiyang Tang, Fu Lei, and Chun Kong Luk (Raymond) students on the semester one TPTM 6155 unit (MLM programme) Institute of Transport and Logistics Studies, Sydney University are acknowledged and appreciated.

7. Implementation: Concluding comments

It is arguable that the conventional supply chain is becoming limited in its ability to identify optional *an innovative responses*. The network based business model first identifies the resources required to meet the value offer understanding, and accepting, that it may not possess all or indeed any of the *assets, processes or capabilities* that will be required to compete successfully in the market. However the analysis does serve to identify a match that is necessary if a strong market response is intended. Demand chain analysis has explored and has ascertained, for example, the role of brands, innovation, and service response and identified the sensitivities of customer response to these and other product-service features. We use the demand chain to identify the customer expectations or, *product/service profile(s)* of markets and their segments. This not only establishes the product and service features for customers but it also prioritises the important, or essential value expectations (or value drivers), the features that will at least guarantee the consideration of prospective customers. Following from this the organisation can develop a series of *product/service characteristics* that will form the basis of the value proposition or response to the customer.

Specifying the operations response chain follows; the conventional supply chain is becoming limited in its ability to identify optional *an innovative responses*. The network based business model first identifies the resources required to meet the value offer understanding, and accepting, that it may not possess all or indeed any of the *assets, processes or capabilities* that will be required to compete successfully in the market. However the analysis does serve to identify a match that is necessary if a strong market response is intended. Demand chain analysis has explored and has ascertained, for example, the role of brands, innovation, and service response and identified the sensitivities of customer response to these and other product-service features.

It also identifies structural changes within the industry by identifying the alternative value system structures that prevail, their relative success, and where added value is migrating within the value systems. The operational response determines the *production facilities and networks, market entry networks and the market management networks* that will be required for a successful response. A strategic response requires a skilled integration and coordination of the resources regardless of their ownership and location. As already established all or some of these may be external to the company (possibly in an overseas location) and therefore may be accompanied with high levels of risk and will require to be coordinated by logistics services. **Figure 19** identifies the details.

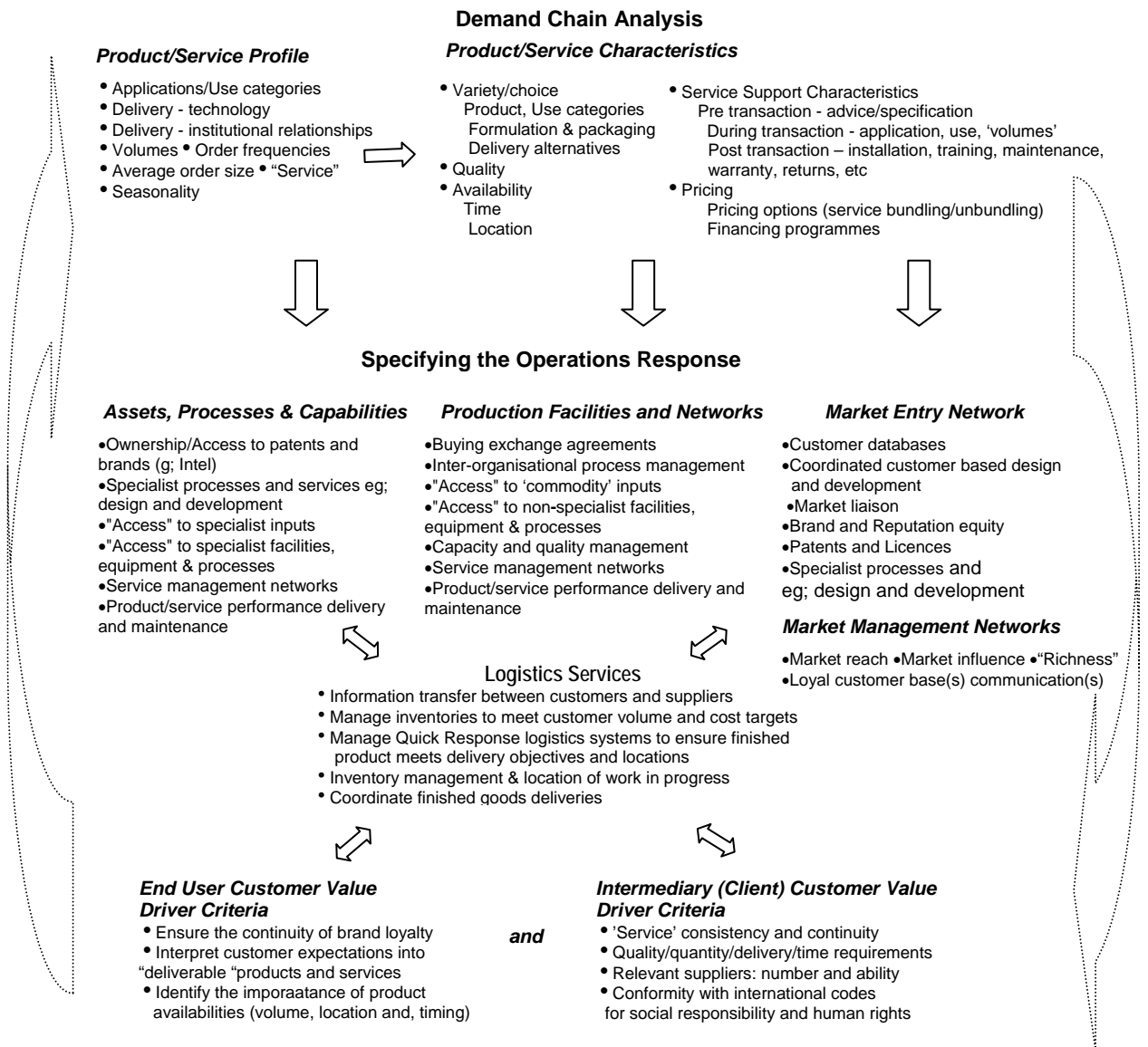


Figure 19: Logistics management optimises market added value in the value chain

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