I T L S

WORKING PAPER

ITLS-WP-08-19

Response management: Strategic and operational considerations

By

David Walters

August 2008

ISSN 1832-570X

INSTITUTE of TRANSPORT and LOGISTICS STUDIES

The Australian Key Centre in Transport and Logistics Management

The University of Sydney

Established under the Australian Research Council's Key Centre Program.

NUMBER: Working Paper ITLS-WP-08-19

TITLE: **Response management: Strategic and operational considerations**

ABSTRACT:

The 21st century is well underway and already the future is becoming clear. The opportunities confronting business organisations include; new high added-value product-services, new business models, new approaches to manufacturing and operations, and emerging technologies and applications. The threats are quite clear: increasing competition from emerging economies, shortening product life cycles and therefore life spans for innovation, complex environmental and sustainability issues, a changing international socio-economic environment, an increasing regulatory climate and, changing business and values.

For many organisations the issues are clear and understood and steps are being undertaken to minimise the threats and to maximise the opportunities; these are relatively straight forward for companies in the fmcg industries where they are close to the final consumer. However many do not have that "luxury" and need to think through how the dynamics of the demand chain can be captured and understood and, further, whether the supply chain that has served many over recent years needs to be re-examined.

This paper addresses these issues. It describes the relationships between the demand chain, the supply chain, and the value chain and Identifies companies that have been successful by embracing the notion that there is a need to be customer-centric – wherever you may be in the value chain.

KEY WORDS: ***Dynamic business environment; demand chain analysis and management; response management***

AUTHORS: David Walters

CONTACT: Institute of Transport and Logistics Studies **(C37)**

The Australian Key Centre in Transport Management

The University of Sydney NSW 2006 Australia

Telephone: +61 9351 0071
Facsimile: +61 9351 0088
E-mail: itlsinfo@itls.usyd.edu.au
Internet: http://www.itls.usyd.edu.au

DATE: August 2008

1. Introduction

There has been a considerable international debate concerning the future of manufacturing and operations management and the impact of a rapidly changing business environment. The Manu*future*-European Technology Platform was launched in December 2004 from which emanated a recommendation for the preparation of a more detailed Strategic Research Agenda, identifying research priorities to be implemented. The report identified two major threats to European manufacturing, but these are not exclusive to Europe they have widespread international implications. In the high value/low volume sectors the threat is emerging from developed countries; in the high volume/low value sectors the threat is from the industrialised Asian countries. However it is arguable that countries such as India and China now compete in both sectors.

The Manu*future* Strategic Research Agenda identified a number of important drivers:

- Competition from emerging economies
- Shortening product life cycles
- Environmental and sustainability issues
- Socio-economic environment
- Regulatory climate
- Values and public acceptance

Suggested countermeasures for competitive and sustainable reaction to these challenges:

- New high added-value product -services
- New business models
- New manufacturing engineering
- Emerging manufacturing science and technologies
- Transformation of existing education structures to support world class manufacturing, researcher mobility, multidisciplinary and lifelong learning.

Manu*future* considers the changing characteristics of the marketplace suggesting the market increasingly demands products that are customised, yet available with short delivery times. The business focus must shift from designing and selling *physical* products to supplying a *system* of product-services that meet end-user demands while they also reduce total life-cycle costs and environmental impact. A fundamental concept of the Manu*future* vision is one of "innovating production" which embraces new business models, new modes of "manufacturing engineering" and ability to profit from ground breaking manufacturing sciences and technologies. The report suggests a dominant business model that will emerge:

"The "virtual factory" of the future will manufacture in adaptable value chain networks linking medium and large-sized OEMs with value chain partners and suppliers of factory equipment/services selected according to needs at a given time. Its composition will not be limited by the presumption of physical co-location, nor by a need to maintain long-term relationships" Executive Summary, Manu*future*-EU, 2006

Papers at the IMS (Intelligent Manufacturing Systems) Vision Forum 2006 made similar points. Jason Myers (Canadian Manufacturers & Exporters, Canada) identified four 'agents of change' for *Next Generation Manufacturing*:

- *Customised solutions* – integrating capabilities through products, services, and information to meet individual customer requirements.
- *A lean approach* – minimising waste and emphasising resource utilisation
- *The Competitive Batch of One* – creating individual solutions in a cost-effective (and profitable) way; and
- *Time* – instant delivery of service to all customers

Myers suggested that manufacturing responses are already operating in the context of value chains that compete against each other; suggesting further that the extended businesses of the future will be virtual enterprises in which business units continuously reconfigure their operations, collaborative partnerships, and supply chain relationships, forming and reforming value chain networks on a project by project basis, relying upon value chain networked information systems and virtual engineering to ensure *concurrent* design, production, marketing, service and sales support. They will operate as if their firms are members of a single and flexible enterprise. There can be little doubt concerning the impact of these developments on all operations processes, particularly manufacturing and sales, and logistics and supply chain management processes.

2. Questioning the supply chain: The emergence of demand chain thinking

Supply chain management supporters have argued that 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.

Tierney (2003) quoting Lee depicted a triangle with customer demand at the pinnacle and supply chain and demand chain management at the bases. He cites the success of 7-Eleven Japan, whose stock prices continued to increase despite Japan's recession for the past 10 years. The secret of its success is demand-led management, which led it to identify sales patterns and customer preferences and to match those by reengineering its category management and store product layouts resulting in increased sales and profitability. They emphasise the point that demand chain management attempts to

analyse and understand overall demand for markets within the firm's current and potential product range. Supply chains, by contrast emphasise the efficiencies in the production and logistics processes, while the demand chain emphasises effectiveness in the business. A very useful point in their argument is that demand chain analysis and management helps to improve an organisation's processes by aligning the organisation around a common plan, improves coordination within the supply chain by using forecasts and plans, and exploits the commercial processes by understanding consumer demand and by selecting those markets that best meet an organisations, owned and/or 'leased', skills and resources.

This introduces the notion that an effective approach to operations management is through demand chain management. It first requires the organisation to understand its current and potential markets and second to identify the essential (or core) processes and capabilities that are required for success. They offer a useful comparison of the two approaches. Godsell et al (2006) take the debate yet further and pursued a demand strategy model that comprises a marketing component - demand definition and creation- and also a supply chain component - demand fulfilment. Their approach offers an integrated demand chain/supply chain with a number of activities.

(1) Demand chain objectives are based upon the organisational needs to address revenue generation and cost reduction holistically. A market strategy (2) identifies a "relevant basis for segmentation that is meaningful not only to sales and marketing but also to the supply chain." This is followed by (3) linking market strategy to supply chain process strategy, whereby appropriate supply chain strategy processes are aligned with customer value drivers; it is influenced by patterns of demand flow and the extent of customisation. Process enablers (4) facilitate implementation of the supply chain process. These are suggested to be organisational design, a performance management system that measures and motivates individual and organisational activities, and, relevant information systems that drive the overall process.

Mentzer (2006) assumes a similar role for demand chain management. He argues that demand management is the creation, across the supply chain of a coordinated flow of demand. Marketing should create demand opportunities for various products but promotional activities are often not shared with other stakeholders be the intra or inter organisational partners. Mentzer suggests that the role of demand management may well be to decrease demand because the opportunity that has been identified cannot be met profitably. Demand management should asses the profit (and cash flow impact?) of alternative products and customers referring to capability and capacity constraints. In terms of the current "push" and "pull" strategies "pull" activities are emphasised where capabilities and capacity exists and lessened where they are constrained.

Mentzer is also suggesting another role for demand management – the relationship management aspects of supply chain management. Here the suggestion is that demand management is well suited to working with both downstream partners to agree performance measures (and rewards) but also to coordinate a matching process in which inter-organisational capabilities and capacities are coordinated in an attempt at achieving optimal market and financial performance. Mentzer discusses the interrelationships between sales forecasts and demand suggesting that a sales forecast projects the future of expected demand given a stated set of environmental demands and organisational capabilities and capacities.

The organisation's response is an operational plan that details response processes and plans designed to meet the sales forecast through the implementation of procurement, production and logistics plans. He makes a significant point by suggesting that sales force remuneration should be geared to the capacity and capability constraints detailed by the operational plan.

It is becoming increasingly apparent that supply chain coordination is not efficient without an adequate understanding of demand; the issue for management is how best to address the problem. Godsell et al op cit suggest this be achieved by defining "demand chain objectives that align with the relevant business unit strategy"; while it is claimed that "these objectives provide all employees in the demand chain with an aligned set of objectives and measures". It also assumes the strategies are relevant. Perhaps their model would benefit from a "market opportunity analysis" process that explores the demand characteristics comprising opportunity on a more extensive scale. An important step is common to each of these contributions; it is to re-validate the notion of the demand chain as a separate entity from the supply chain.

This is not simply another re-statement of the marketing concept. Marketing is a philosophy, stressing the customer centric goals of an organisation. The demand chain is a practical description and analysis encompassing all those processes within the firm that adopt and apply that philosophy. An interesting way of viewing this is to apply the model developed by MacMillan and McGrath (1997) who suggest that the customer life cycle, or the consumption chain, is a means by which firms: "… can uncover opportunities to position their offerings in ways that they and their competitors would never have thought possible". "Mapping the Consumption Chain" captures the customer's total experience with a product or service. Such a process identifies numerous ways in which value can be added to a product or service.

The mapping process to identify the consumption chain comprises a series of questions aimed at establishing aspects of behaviour that occur. The answers to these questions identify opportunities to add value and determine the shape of both the demand chain and of the required supply chain responses. From an analysis of the answers it then becomes possible to identify the different process drivers, some of which can be categorised as demand driven and some as supply driven are all essential to motivate customer expectations and subsequently purchase decisions. An efficient supply chain alone provides only half the solution, as does an efficient demand chain. The answer is suggested to be an effective demand chain that encourages a strategic approach to market response.

Perhaps an example here will help. Dell Computers operate a demand led customer response supply chain. Their business model is an example of Bucklin's postponement (as opposed to speculation) channel model of some years ago. The Dell model reflects the emphasis on financial performance as a criterion and as such the Dell business model is very cash effective. Stank and Mentzer (2007) describe DSI (Demand and Supply Integration) an approach by Dell that enables (and empowers) customer service representatives to access sales, marketing and supply chain information to resolve problems that occur when specific (ordered) components are unavailable by offering customers alternatives at acceptable incremental prices. DSI has been developed from an integrated sales and operations planning process, in which operational plans link procurement, manufacturing, distribution, finance and human resource plans. A demand plan determines what should be marketed and sold and when – given the supply

capabilities and constraints of the organisation. Demand plans may involve suppressing demand when availability of components is constrained, placing marketing emphasis on products where inventory levels are exceeding limits, or shifting demand towards higher margin products

In other words it is the combination of an understanding of the market characteristics that provide demand sensitive features which in turn provide the essential response management competitive necessity and competitive advantage characteristics that form essential inputs into a structured response to market opportunity. Figure 1 illustrates a process by which a customer led organisation can identify and respond to customer sensitive performance expectations.

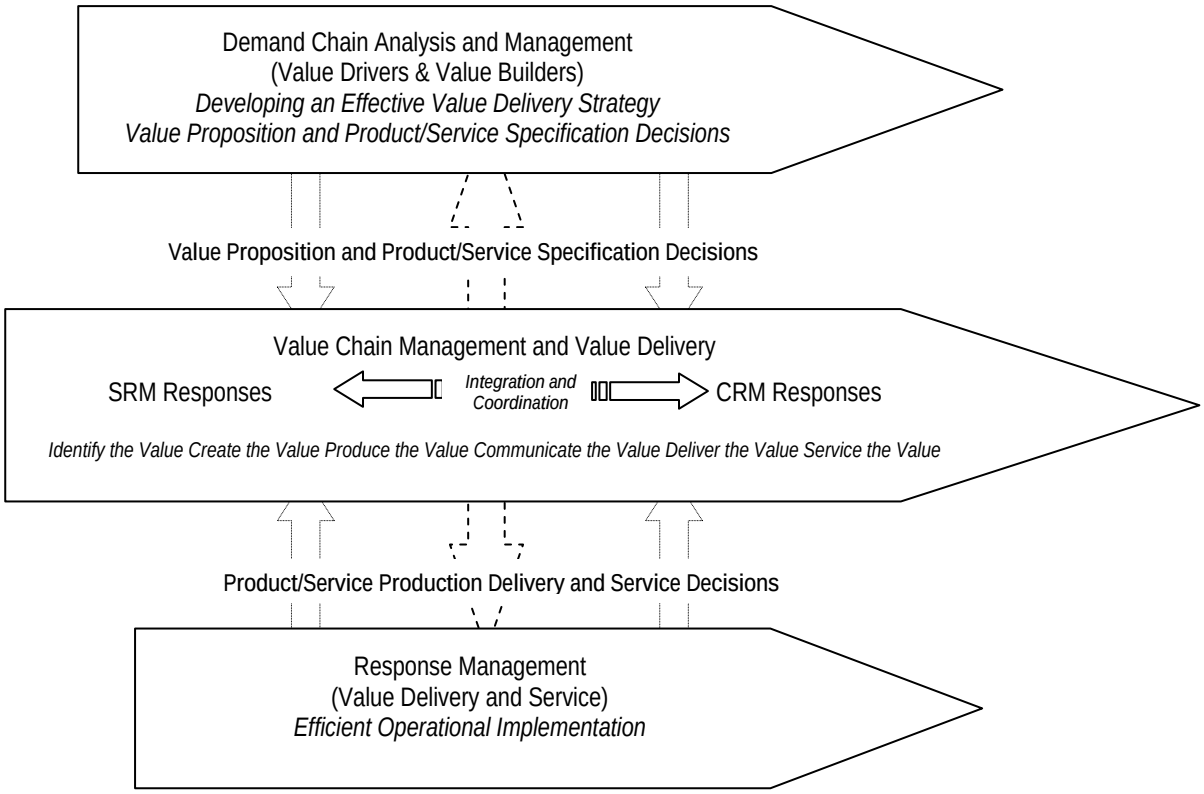

Figure 1: Demand chain analysis offers focused response

These can be short and long term features that form the basis of a market response offer. The ***value drivers*** in any business depend upon the specific market setting, competitive intensity, asset utilisation, bad debt ratio, supplier costs , labour costs, market share, flexibility/multi-schilling, brand equity and brand leverage, etc. Their time perspective is clearly short-term given they are factors that "drive present value" and as levers of present value. Focus on adjustments to the value drivers results in short-term improvements in performance. Supplier responses include strategic adjustments and operational implementation characteristics such as:

- Integrated and value chain networked procurement and production operations
- Synchronized cash and operating cycles that enhance working capital productivity
- Access to relevant process and capabilities management

- Agile/flexible production facilities and value chain networks
- A *response management* process that integrates logistics processes with sales operations
- Proactive and reactive service response value chain networks
- Market entry and management value chain networks

Clearly both suppliers and customers have value drivers and while it is stating the obvious to say that creating value creates costs, it is essential that supplier value driver responses and cost drivers are matched. It follows that effective demand chain analysis should include an understanding of the *impact* on customers that an effective and efficient delivery of value driver performance on customer behaviour and of the impact that changing the level and method of delivering value driver expectations can have on customer response and organisational cost structures

Value builders help build *long-term* future value (Phelps B (2004), "Smart Business Metrics", FT Prentice Hall (Pearson), Harlow, UK - They give an organisation the ability to plan to take advantage of opportunities as they arise and help avoid threats and risks. For this to be effective *value builders* are built on *positional and capability characteristics. Positional characteristics* are; strategic direction, investment and gearing levels, partnerships, and the ability to *capture value* in a dynamic market environment by building and strengthening relationships externally and internally, and expanding (or at least maintaining) shareholder value. Among the *capability characteristics* are; quality of management, innovative expertise, flexible processes, etc. The ability to capture value in a dynamic market environment is "value led" and management should plan around responses, such as:

- Customer aligned solutions
- Innovative product-service solutions
- Innovative processes
- Adaptive organisational structure
- Value chain value chain networks positioning
- Value chain network modularity
- Value chain networks orchestration
- Develop long-tem value chain loyalty relationships that encourage increased comprehensive customer cooperation & commitment

An organisation should attempt the difficult task of interpreting demand trends; particularly for important in B2B relationships where failure to do so may result in the breakdown of profitable customer relationships as customers adopt emerging process technology. Similarly an attempt should be made to explore the strategic and structural cost structures that future customer and organisation value builders may require. There is an implied suggestion emerging from current views of future technology and relationship management trends that the traditional production economics of scale and scope will give way to production economics based on integration, coordination, interaction and differentiation. The business environment is confronted with an increasing level of regulatory requirements concerning resources conservation and emissions controls. It is interesting to note that a UK company, Johnson Mathey, identified vehicle pollution regulation as a *value builder* in 1974 and has built a leading position in vehicle catalytic conversion equipment. Its current earnings growth of 8/10 percent is expected to increase to 14 percent in 2009. It is becoming a major player in the development of diesel control equipment ahead of anticipated EU legislation (Ashton: 2008)

There is an increasing number of software "solutions" to demand chain management. For example companies such as ***Kinaxis***, who offer: "an on-demand Response Management service for visibility and coordination to drive rapid response to constant change across global supply and fulfilment networks, resulting in breakthroughs in customer service and operating performance. Kinaxis ***Rapid****Response* combines multi-enterprise visibility, collaborative "what-if" analysis and rapid decision support to empower front-line manufacturing and fulfilment teams to take quick and effective action when faced with constant changes in demand, supply and product (Kinaxis promotional materials). ***Demand Solutions*** offer an approach that integrates sales and operations planning. It is software driven process that integrates company data such as demand forecasts and customer account profiles. But is life is that simple!!!

Understanding the demand chain does not necessarily lead to managing the demand chain. It is not uncommon for demand chain analysis to identify customer expectorations for which an economically viable response is not sustainable. It follows that demand chain management becomes a process in which sales operations negotiates viable outcomes with customers. An example: in the late 1990s a gases supplier reviewed its sales operations by customer segment and was surprised to find a mixed response from customers. Some were dissatisfied with the level of service delivered with others being over serviced. Furthermore pricing policy bore no relationship to either sales volumes or service delivery; indeed some low volume users received a delivery frequency rate greater than their usage rate and were building inventory of not only gases but more importantly gas cylinders whose value was considerably greater than the contents and were the supplier's inventory cost, not the customers! This simple example identifies the difference between a marketing oriented organisation and one that is a solution based customer centric company.

3. Current problems

3.1 Demand chains and responses: implications

At the *Demand Solutions* 2007 conference, Bill Harrison, president of Demand Solutions identified five key trends in supply chain management; globalisation, collaboration, product innovation, flexibility, and "green". These were reflected in other conferences and symposia, similar issues had been identified by the *Manu*future and the IMS Vision Forum (see above) and they may be summarised as:

- Macro Economy Issues
- Increasing and intensifying global competition and increasing product-service diversity in the "New Economy"
- Decreasing PLC effectiveness and a decrease in the time advantages of innovation
- An international increase in socio-economic aspirations and means
- An increasingly constraining regulatory environment
- Micro Industry issues
- Intensified customer centricity : "one customer- one solution"
- "Customisation" expanding into an increasing number of product-service markets
- Decreasing response time availability

The implications of these can be summarised as:

- Asset management
- Fixed asset intensity/capacity utilisation
- Working capital productivity – inventory, receivables and payables
- Customised product-service solutions
- Product/component "fit-for-purpose"
- "Service-fit" – delivery frequency and reliability issues
- Cost management
- Materials costs
- Labour costs
- Service costs
- Time management
- Strategic concerns – "time-to-market"
- Operational concerns – "response times"
- Performance management
- "Market" Share of market-value
- "Financial" Stakeholder return on investment
- Risk management
- Relationship risk
- Business model risk
- Political and regulatory risk

Ohmae (2005) suggested new rules for the "new economy", adding that there is a problem posed – nobody yet is clear on what the rules are. However it does imply that companies have to rethink everything, from strategy through to structure – and back again in the dynamic environment of the twenty-first century. Ohmae is suggesting this approach includes supply and customer markets, together with the business models that made many organisations successful. Ohmae suggested a 'prescription' for handling the new economy based upon *communications* (the introduction of information communications technology – ITC – to manage interactions and transactions *(technology management)*); *capital* (with the notion here that it is now 'borderless' and hence rapidly transferable (aspects of *relationship management)*); *corporation* (here the concept of the virtual organisation is one that reaches across organisational and international borders *(and applies aspects of relationship and process management)*, and; *consumers* (the inference being that on-line customer contact (aspects of both *technology and relationship management)* offers a facility to meet customer expectations more closely and more rapidly than ever before. Essentially Ohmae shares Friedman's (200) view that we live in a changing world and his message is that a far wider perspective of the business environment is becoming necessary; furthermore this requires management to establish credible scenarios for the future of their organisation and evaluate these with credible "what if?" analysis

For example, how many organisations had expected the current environment of rapidly increasing energy prices, and postulated their impact on transportation costs? Furthermore, of those who had, how many had viable response plans in place? Mortished (2008) identifies some alarming consequences for the ratio of low value commodity products to their transport costs over long distances. Mortishead writes:

"The economics of long-distance supply chains are being rewritten; if it is small and expensive – drugs and sophisticated electronics, for example – fuel costs have little impact, but bulky goods are under the cosh. Furniture, footwear, basic machinery, building materials – this is the stuff that China exports in vast quantities to America and it was very cheap, until now"

And, quoting CIBC World Markets, estimates:

"The freight costs of importing goods into America represented an effective tariff of 3 per cent when the price of oil was $20 per barrel in 2000; it is now more than 9 percent and will rise to 11 percent if oil hits $150"

In early July News Poll reported a major decline in Australian Consumer Confidence in the six months from December 2007 and the response of a number of organisations has been simply to cut profit forecasts. Others have anticipated these current problems. For example McPhersons a consumer products distributor whose product ranges include hair and beauty care accessories, impulse products, baby-care accessories, cutlery and kitchen knives, kitchenware, bake ware, cookware, dinnerware and glassware as well as outdoor and hardware products have avoided the downturn in consumer spending (June 17, 2008) by a planned program of cost reductions, eliminating underperforming range items *and* innovation in higher margin products. David Allman, CEO, (reported by Waugh: 2008) suggested their product portfolio of non-discretionary consumer goods, that do not have high unit prices, and that are not particularly influenced by spending patterns, together with the width of McPherson's distribution channel portfolio, grocery, discount department stores, pharmacy and hardware rather than a narrow approach, are significant factors in providing resilience in the current situation. Clearly there are some pressing issues. Are there answers?

4. An approach: A new business model

The business model has often taken second place to strategy in management thinking and focus. Normann (2001) discussed "a new strategic logic", suggesting 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". This comment is very pertinent for business logistics management in the emerging business model.

4.1 Organisational structures need to match the opportunity environment

Clearly many organisations and companies are aware of the changing environment that confronts them. Table one compares the traditional approaches that were commonplace in the 1980s/1990s with those apparent in current, progressive, organisations. Many of the concepts in table one need no explanation but perhaps two (*) items do need explanation. *Super-optimal productivity* refers to the ability to couple processes such as design and development through ICT (information communications technologies) to increase productivity in a time space. The example given by Friedman *op cit* (Bell and Lucent working a 24 hour shift across China, India and the US) is an example of *super-optimal productivity. Interpreneurship* refers to the management expertise required to integrate the resources (assets, processes, and capabilities) of an alliance or partnership comprising a number of independent organisations.

Table 1: Characteristics of the emerging business models

Traditional Approaches Were/Are	New Approaches Are/or Are Becoming
Command	Integration
Control	Coordination
Vertical/hierarchical structures	Holistic/virtual structures
Suboptimal productivity	Super-optimal productivity*
Reactive market responses	Proactive market responses
Inter-organisational competition	Inter-organisational collaboration
Generic and mass customised solutions	Customer specific product-service solutions
Lagged/limited content/expensive system communications	Instantaneous/comprehensive content/low cost communications
Restricted interactions	Comprehensive interactions
Entrepreneurship and Intrapreneurship	Interpreneurship*

4.2 Relationship management and value chain networks

A significant contributory factor has been the increasing dependence upon relationship management in almost every industry we choose to consider. Figure 2 extends the proposition made by Figure 1 by presenting the basic components of the value chain value chain network model.

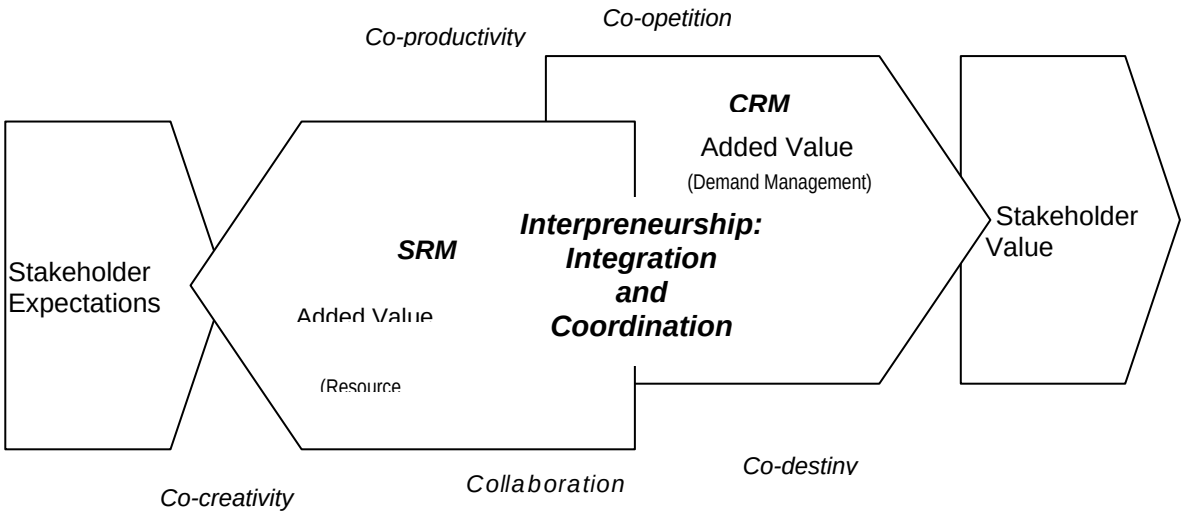

Figure 2: A network based business model

4.3 Networks

Figure 2 has a number of features that differentiate it from the traditional vertically integrated model of "yester year". It reflects the transparency that has replaced the corporate secrecy of the traditional vertically integrated business model and the flexibility and agility that network structures are known for. This "new economy" approach has been accompanied by an exclusive vocabulary. Terms such as *collaboration* describes the overall willingness of organisations to seek and implement customer based solutions using shared resources and producing shared benefits. C*o-creativity*, or p*rosumerism*, is the involvement of consumers (and possibly that of distributors) in the design and development of product-services. *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. *Co-destiny* is used to ascertain the extent to which members of a business coalition share the same objectives, strategies and values. *Interpreneurship* refers to the management expertise required to identify the opportunities to introduce new (and alternative) business models and processes into new and existing markets

Figures 3 and 4 give examples of typical networks. The aerospace and automobile industries typically work around *fixed value chain networks,* with organisations such as Boeing and Toyota being examples of effective fixed value chain networks structures. By contrast Li and Fung, the Hong Kong based organisation, operate a number of *flexible value chain networks* that reflect the needs of their 'client organisations. They are *global operations;* they source from a range of locations, usually based upon a series of criteria such as input costs, local taxation policies and labour legislation and, increasingly, the availability of a potential domestic market for their products. *Time management* is critical from two aspects. *Time-to-market* may have an impact on whether the organisation is an innovator or an imitator and here not only time is a consideration but so too are cost capability, and capacity. Friedman (2006) *op cit* provides examples of organisations who have established "twenty four hour R&D" facilities using Internet linkages around the globe to maintain R&D productivity.

Equally *time-for-customer response* is important with organisations such as Zara (a European based apparel manufacturer) replenishing inventories throughout Europe on a 24/48 hour basis. And they are *cash flow driven* organisations, focusing on effective operational and financial interface structures that ensure that operating cycles and cash-to-cash cycles are synchronised to ensure efficient working capital productivity.

The value chain value chain networks 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 then strategically effective and operationally 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. The attraction of virtual value chain networks systems is that they identify alternative structural formats for responding to the three principle value drivers; time, availability and reliability by taking a much broader perspective of "organisation". Information transparency is an important input throughout the implementation of the process by managing the time and accuracy of product/material volumes, the timely flow of cash transactions internally and externally among suppliers and end-user customers.

A number of organisations have developed interesting and effective business models around these concepts. It is well known that 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. In both these examples the organisations manage their value chain networks based upon effective and efficient management of logistics flows and relationships. Boeing is using a quite new approach for the 787. Boeing is retaining much of the expertise of all levels of production within the organization; however the Company is collaborating with its partners at several stages of design and production; (Harrigan : 2006). Boeing has reduced the number of its suppliers and selected some key partners as tier one suppliers to manufacture more complex products. In Boeing's supply chain, the first-tier suppliers are considered as an extension of Boeing's internal processes.

Focus is on asset leverage 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. Tier two suppliers, that used to supply directly to Boeing, are now supplying to the key top-tier suppliers, (Manufacturing and Business Technology (2007). Traditionally, the majority of parts contracted directly by Boeing are delivered to Boeing facilities, now; however, they are delivered to the key partners' facilities. Tier one partners are responsible for all the design, engineering, manufacture and assembly of these components. After these large parts are completed, they are delivered to Boeing facilities for final assembly. By doing this, Boeing has largely reduced the parts to be

assembled in Boeing's facilities. Lam (2005). It is well known that this model has created problems for Boeing during construction due to component and system compatibility problems. Perhaps introducing both product and process innovation simultaneously is being too ambitious!

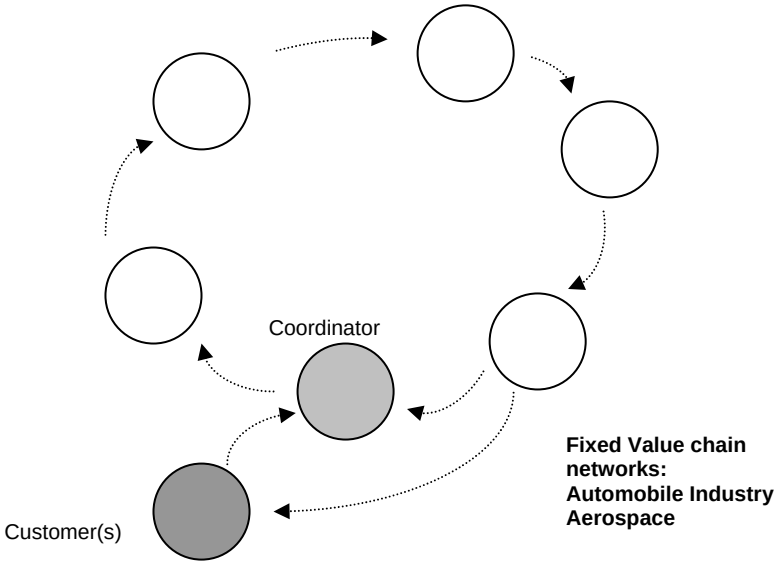

Figure 3: Fixed value chain networks create stronger supplier/customer relationships built on long-term relationships based on an understanding of mutual objectives

These value chain networks are typical of the "high value – low volume" manufacturing model in which each partner creates an input for which design, quality and time expectations have been agreed. Furthermore within the context of figure 2 the value chain networks is integrated and coordinated by a principal such as Toyota or Boeing.

Figure 4 represents quite a different approach, one typified by Li and Fung, one in which time management and flexibility – even agility – are primary value drivers. Li and Fung (2008) give examples from their experience of the need for flexible response value chain network management. Having identified a response value chain networks that offered a client the value drivers required to establish competitive advantage (primarily product quality within a time objective) they were asked to manage a rapid replenishment cycle to capitalise on an item that had proved more successful than forecast. Their value chain network management structure had been designed to meet such contingencies. Flexible value chain networks are usually found in volume operations "low/medium value – medium/high volume" manufacturing, a sector which although usually price led has segments in which "style" and quality are also dominant. It is not unusual to find "major" suppliers in the value chain networks that are part of other value chain networks. It reflects the typical business that struggles to compete with off-shore suppliers. It is usual for these organisations to opt for specific value chain value chain networks roles; Nike for example, has a business model in this category. The company is strong in product design and marketing and outsources the other necessary processes. The model is also typical of that of very large FMCG producers, such as food and hardware products. Increasingly the outsourcing model is being favoured by these organisations who favour models similar to Nike and others in which they focus on their core processes of product design and development and

marketing and rely on outsourced expertise to provide manufacturing and physical distribution; McPherson's (above) would be a typical example.

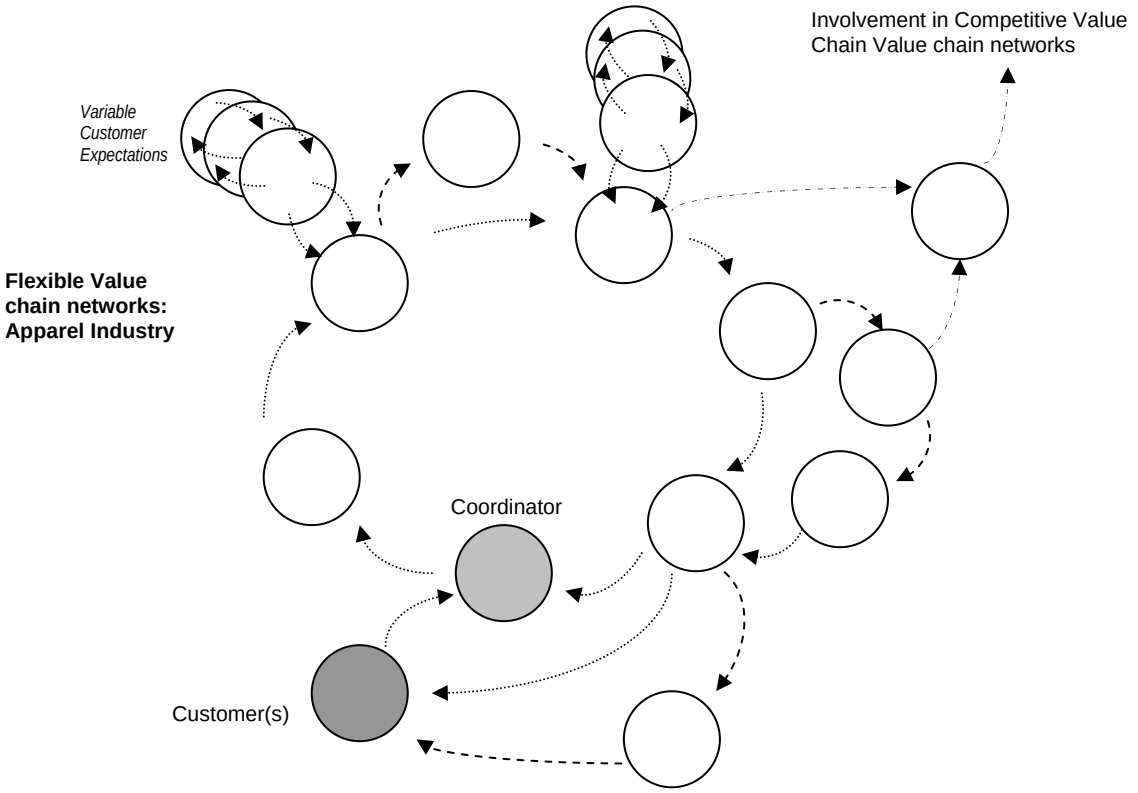

Figure 4: Flexible value chain networks offer variable responses to meet changing market requirements

Some other examples of Australian organisations engaged in successful value chain networks are given in Figure 5. The Bishops Technology Group collaborates with partners across the world to develop new innovative products. Grey, CEO, suggests that an important facet of this activity is the relative ease with which information that flows between ODMs, suppliers, logistics providers, distributors, wholesalers and retailers can be captured providing valuable input about the efficacy of product design, and distributor and customer response, Grey (2006). This suggests a major difference between rigid resource systems and mobilised resource systems. Mobilised systems use demand chain analysis to identify opportunities and then identify the resource base required to compete successfully, and, in doing so expand (or contract) the resources network. This extends to the end-user customers who become co-creators by participating in the design process. This approach does not infer that the final output of the mobilised resources model is a highly customised, unique product; it is suggesting that customer satisfaction can be more closely achieved by using product and process platforms as modular systems that can be combined in a number of ways to meet end-user demand. Examples of product platforms are seen in the automotive industry where platform components are shared on an intra- and inter-organisational base. Examples of process platforms are seen in Internet merchandisers such as Amazon and e-Bay.

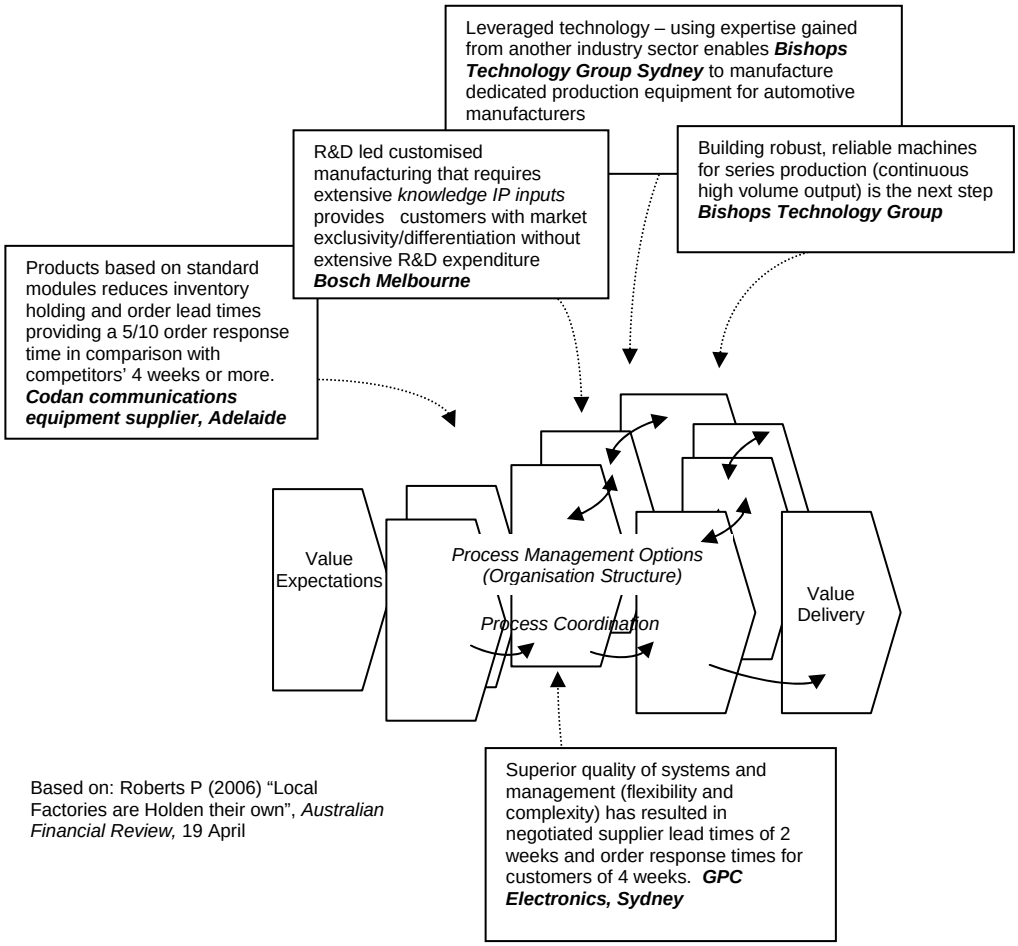

Figure 5: Examples of Australian companies have adapted to the value chain network approach

5. Response management in value chain network systems

The attraction of virtual network systems is that they identify alternative structural formats for responding to the three underlying value drivers; time, availability and reliability by taking a much broader perspective of "organisation". Figure 6 explores this proposition by considering organisation as an intra and inter-organisational network that includes the customer as a component within the structure. Information transparency is an important input throughout the implementation of the process by managing the time and accuracy of product/material volumes, the timely flow of cash transactions internally and externally among suppliers and end-user customers. The role of the *inter*preneur is to identify process structures that optimise stakeholder returns; communication is vital for effective coordination.

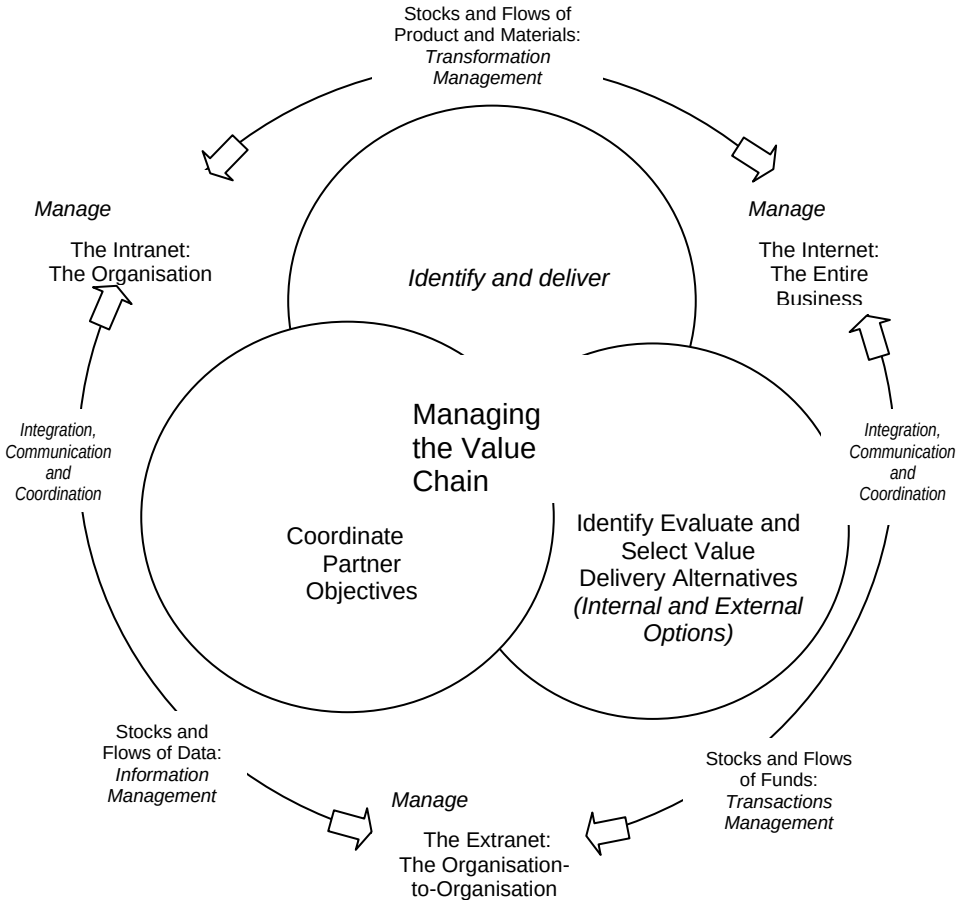

Figure 6: The logistics of the extended enterprise

A number of organisations have developed interesting and effective business models around these concepts. 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. In both these examples the organisations manage their networks based upon effective and efficient management of logistics flows and relationships.

5.1 Process: how do the successful companies operate?

We have argued that viewing supply chain management in isolation as a purely mechanistic approach entirely driven by *cost efficiency* needs to be replaced with a broader view of overall *effectiveness* (Rainbird: 2004; Walters and Rainbird: 2006). It is interesting to recall a comment by Porter (1996) concerning the mistakes that can be made by confusing *operational efficiency* with *strategic effectiveness*. Porter is suggesting that the attraction of the cost-efficiency offered by the increasing range of logistic and production techniques has directed management towards short-term profitability at the expense of increased strategic advantage gained from understanding customer value expectations.

So how does this all come together? An approach is given by Figure 7 in which a generic view of the overall process and its component activities are presented. Central to the entire process is the knowledge driven linkage between the demand chain and the operations response system. Identifying the relevant questions (and sources) is crucial and mistakes here can be costly.

Given an understanding of the *customer value drivers* these may be used to identify the planning issues that need to be addressed when constructing the operations response system. An obvious place to start is to identify the processes that generate value for customers. Slywotzky and Morrison (1997), in their "customer-centric" approach suggest the - "things that are so important to customers they may go elsewhere for" - the customers' *significant* value drivers are those that customer add value. Within the context of the value chain *(Demand Chain Analysis + the Operations Response System Response + Demand Chain Management)*, value drivers assume a threefold significance. One is clearly that of identifying and adding value for customers; the other is the ability to differentiate the value offer such that it creates competitive advantage. The third is that it identifies the roles and tasks of partner stakeholders.

Five questions emerge:

- What is the combination of value drivers required by the target customer group?
- What is the customer group's order of priority?
- What are the implications for differentiation decisions? Are there opportunities for long term competitive advantage?
- What are the implications for cost structures? Is there a role for partnerships?
- Are there opportunities for trade-offs to occur between value chain partners that may result in *increased* customer value (and stakeholder value) or *decreases* in the value system costs or the costs of the target customer group?

Figure 7 suggests how these questions are now being addressed in what Seely-Brown and Hagel identify as "pull" organisations. Li and Fung and the Taiwan computer ODMs know and understand the implications of customer value drivers on the operations response system processes. Identifying these relationships at an early stage provides early input into the structure of the operations response system – the essential "customer facing processes" the critical processes that create "things that are so important to customers" are identified at an early stage of the planning, those that are "in-house", that is available within the existing structure, can be evaluated for capability and capacity suitability, and system modifications made where necessary. This initial analysis extends the response decision beyond *competitive necessity* towards developing *competitive advantage,* perhaps into a position of *sustainable competitive advantage.* There are also two other influences that need to be addressed. One concerns the increasing level of financial accountability that is being placed on management and the other is the impact of resources conservation awareness.

Figure 7 identifies the importance of the *demand chain* in initiating the response. The *demand channel profile* identifies the potential market and the segment(s) that represent potentially relevant opportunities to the organisation. The potential segments may be evaluated by considering the *resource requirements* (the assets, processes, capabilities and capacities) necessary if a viable market is to be established. The efficacy of the

various alternatives can be assessed by comparing the revenues and costs that each will generate (see below for a discussion on performance metrics). Clearly this initial evaluation is likely to eliminate some of the alternatives, either on the basis of unacceptable financial and/or marketing performance, or because the "control" characteristics distance the company from the ability to make and implement major decisions in supply markets or in downstream distribution and end user markets.

Response management comprises *both product–service and production processes* design; decisions here determine procurement and supply chain processes. This practice is increasing in the apparel industry; Li and Fung (Roberts and Hagel (op cit); www.lifung.com) implement their retailer customers' product-service design programs by carefully selecting materials and process suppliers that are relevant to the customer's market positioning; the *variety, inventory and quality* trade-off issues; however the choice is no longer *which*- but rather a combination of *who? How? where?, and when?* - As organisations become virtual networks.

The development of mass customisation and product platforms has led to 'low cost differentiation' in a number of industries. *Cooperation* amongst competitors *(co-opetition)* in the automotive industry has resulted in dramatically reduced R D & D and procurement costs and a dramatic increase in customer satisfaction. It is arguable that these changes would have occurred without the philosophies that accompanied the "New Economy". Furthermore, an acceptance by business that free cash flow is a more realistic measure of financial success than simply profitability has widened the strategic planning perspectives of many organisations who now embrace the concept espoused by Normann (2001) that managers should be more concerned with managing assets rather than owning them

This leads us into considering performance measurement. Given a 'network approach' to business structures, together with the view that they are not permanent and are in existence only for as long as they serve a viable commercial purpose, NPV analysis ideally serves the purpose of objective evaluation. Furthermore by setting quantitative and qualitative performance expectations the alternative operational response chain structures can be explored. See Table one below.

Increasingly we are beginning to see the importance of qualitative performance requirements as these become significant features of consumer choice criteria. Li and Fung *op cit* are very clear concerning their view by membership of the Business for Social Responsibility www.bsr.org

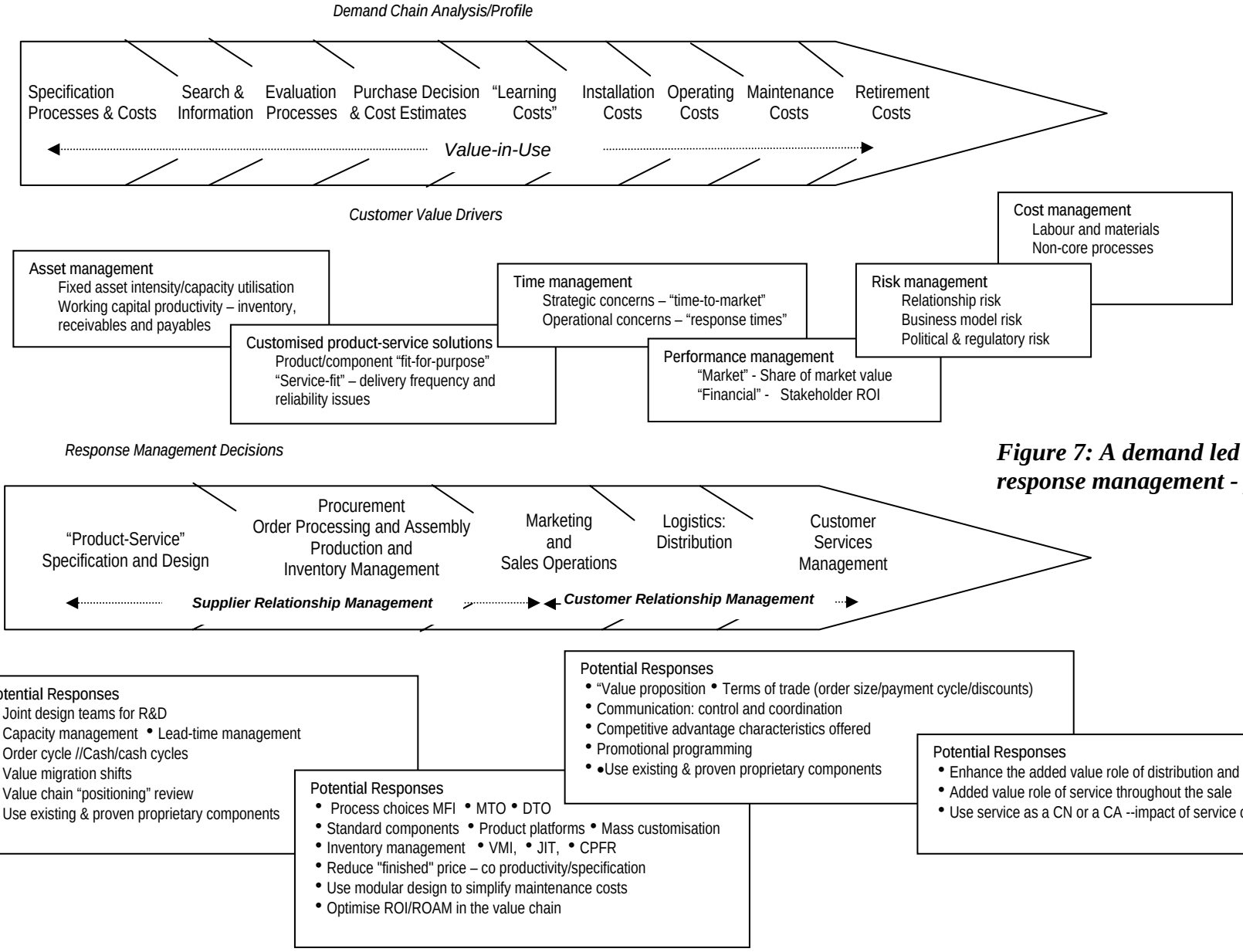

Figure 7: A demand led response management - process

and we also support the principles of the Global Compact www.unglobalcompact.com. We adopt a Code of Conduct for all our vendors."

Table 2: Performance criteria for an operational response chain

Quantitative Performance

Customer Response: (Planned & Actual)

- Order frequency
- Order value(s)
- Loyalty: Longevity of relationship(s)
- Perceptions of Services (CSI trends)

Financial Performance (Operational)

- Gross Margins
- Operating Margins
- Growth Rates
- Share of Market
- Added Value
- Inventory Productivity
- Receivables Productivity
- Payables Productivity

Financial Performance (Strategic)

- ROA (Tangible & Intangible Assets)
- Capital Utilisation
- Capital Intensity
- ROCE
- ROE
- Operational Gearing
- NPV Anticipated Free Cash Flow
- Financial Gearing

6. Some examples

6.1 The Boeing Aircraft Service Organisation

Boeing introduced an added value aspect to its product range with its IMM programme (Integrated Materials Management) that it claims reduces the operating costs of its commercial airline customers. McClenahen (2004) reports that Boeing estimates that it will save customers some 10 per cent to 20 per cent of maintenance materials costs. "Boeing is adapting a supply-chain management approach from the automotive and electronics industries and introducing it to the aviation industry, where the supply chain historically been fragmented". The objective is to aggregate and integrate the supply

chain such that the information produced will reduce inventories and operating costs for customers, Boeing, and the suppliers.

The additional benefit for Boeing is that the information on parts usage will be fed back into design and to customer service engineers, thereby offering an opportunity for creating additional competitive advantage.

Boeing will be responsible for the purchasing, inventory management, storage and distribution of 'single use' parts such as bushings, clamps, brackets, hoses, seals, etc. Boeing and the other suppliers will own the parts (that are stored near the airline's maintenance bases) until required and collect payment from the airlines as and when they are used.

Figure 8 identifies the demand chain inputs into the Boeing planning process. The value drivers of improved fixed asset (aircraft) productivity, working capital productivity, the delegation of responsibility for inventory management and the ability to free up capital for the core business are clear. The resulting value proposition, a customised service parts procurement service implemented by VMI and JIT (vendor managed inventory and just in time) processes is priced such that the service results in a significant overall cost reduction for the users. Among the responses that were required from Boeing are customised service parts programmes, on-line communications with suppliers as well as with customers using EDI linkages, a knowledge management programme that creates knowledge from parts use data that can be input into aircraft design and customer service processes.

Customer and Company Added Value benefits are shown in figure 8 together with the operational and strategic decisions required to implement them. The added value for the airlines is the facility to focus on the revenue generating aspects of airline operations while Boeing takes on the logistics and materials management (and costs) of aircraft servicing. The strategic implications are yet to materialise. For the airlines it may be the initial stages of a global service strategy and one that the engine manufacturers offer in time. The other long-term benefits are helpful to the airlines and to Boeing: the data captured during service transactions and operations can be converted into a source of knowledge for product design and service planning.

As with the other examples the primary value management processes are identified and the component processes are detailed within each of them. The customer value expectations can be expressed as capital and equipment productivity, reduction of non-core activity costs and the risks involved in maintaining inventories containing technological equipment. To create the value Boeing is responding with a high availability of service parts with an online communication service with the airline customers and their (Boeing's) suppliers the result is an improved operating cycle as well as an improved cash cycle. To produce the value Boeing has a customised service process design for reach major customer that not only reflects aircraft type but incorporates flight schedules and frequencies, and global locations of hub operations. The online systems act as a two-way conduit and also as the basis for improving forecasting and planning. Value delivery comprises the continuous availability of service parts at specified locations to meet service schedules. To maintain, or to service the value Boeing must maintain low service operations costs for their customers. This has the twofold benefits of enhanced productivity and cash flow.

6.2 Zara an integrated response management system

Rohwedder (2004) commented on developments in the "fast fashion" segment of the apparel industry. Rohwedder reports on the reaction of the responses of Europe's elite fashion houses to the activities and influences of companies such as Zara, Hennes & Mauritz and large retailers (Wal-Mart). Typically long before the 'elite fashions' reach the boutiques "knockoffs' of the designs appear in the outlets of the fast fashion retailers who have copy, manufacture and distribute them much faster and cheaper than he established designer brands. London, Milan and Paris once dismissed Zara et al as irrelevant but have found it necessary to understand this market segment and how to react to its characteristics. The "fast fashion" retailers have influenced consumer expectations for speed, variety and style at low prices and have found it necessary to make changes to speed up the production cycle. See figure 9

The marketing response by competitors has been to introduce "hot fill-ins" (Escada), mini-collections reflecting trends that develop mid season. Escada stores have been receiving new merchandise every two to three weeks. This is supported by supply chain process that reduce both time and cost. Ferragamo has used ICT techniques to reduce the time-to-market of its designs by some 20 percent, bringing it down to 10 weeks from the usual three months. The company has linked its procurement and production system with those of its suppliers in order to processes times for commissioning prototypes and replenishment. It has introduced the notion of centralised inventory management resulting in lower inventory holding and more rapid sock-turns. Etro SpA (Italy) divides their product line into theme and colour schemes from the moment of conception and changes the style and dominant colour monthly.

Birtwhistle et al (2003) defined and discussed the level of QR (quick response) implementation by fashion retailers by exploring its impact on replenishment processes. They found that information technology is particularly important in driving supply chain responses. They comment that their results suggest that retailers have not fully understood the benefits of implementing a QR strategy and suggest the retailers perceive it more as a strategy for internal supply chain management rather than an external supply chain strategy. This may be a larger issue than they suggest; it suggests that the retailers have not explored their demand chains and identified a suitable supply chain structure to service their customer markets efficiently.

Zara is an interesting organization being part of the Inditex group. Customers of fast fashion expect to have a great variety and choice of up to date well-designed clothes. Quality of the garments and low prices are very important as well. Generally fast fashion products only cost 10% of the price charged by elite fashion design houses. The value expectations of customers can be summarized as follows (in the order of their importance to customers'); current fashion designs, immediate availability of trends (garments from established high-end fashion European elite design houses (e.g. Gucci, Prada, Chanel etc.), variety/choice, low price with commensurate quality (i e, 10% of the price charged by elite fashion design houses), service that includes "ideas" and attractive store design

Zara acquires fabrics in only four colours and postpones dyeing and printing until close to manufacture, thereby reducing waste and minimizing the need to clear unsold inventories. Zara's production model includes a large outsourcing activity in which products are sewn by external workshops located close to Inditex' factories (Heller:

2001. Fabric is pre-cut into pieces and these delivered to the workshops where the worker stitches the fabrics with easy-to-follow instructions into finished products. In these 350 workshops more than 11,000 workers are employed but none of the workshops is actually owned by Zara or Inditex. The network of workshops together with the modern distribution centres enable Zara to react quickly to market changes and new designs during a season. Zara is able to deliver the new design apparel from the drawing board to the stores in one or two weeks and therefore can respond very quickly to fast-changing tastes of their young urban customers (Walker et al: 2000).

The Demand Chain Profile identifies a demographic segment of 17 to 22 year olds that are fashion and budget conscious. Customer value drivers are clearly identified suggesting the company has no doubt concerning the market segment within which it operates. The company's response to the value drivers is a value proposition that specifies merchandise characteristics, customer targeting and retail location strategy. The implications for Zara and its partner suppliers are clearly identified: rapid new product development and time-to-market is an essential requirement for success in this segment together with an ability to ensure the resulting product is manufactured and in distribution while the style remains fashionable,

Zara's supply chain responses are also shown in figure 9. What is clear is the use made of in-house skills (i.e., the resources of Inditex) supplemented by selective outsourcing. Scheduling and quality controls are essential features of the supply chain design: manufacturing is composed of a Zara managed process, garments are "cut" by Zara staff and sent for completion by outsourced workshops that are sent clear instructions for the work to be "finished" with a low risk of the items being rejected. Zara checks each delivered item twice for quality. Physical distribution is a structured process within which product packaging needs play an important role. The distribution centre is built on two levels, one for folded apparel, boxed in cardboard cartons, the other for plastic covered garments on hangers. Tagliabue (2003) reported the system to be capable of handling 40000 items an hour and completing store deliveries within 24-48 hours by road and air throughout Europe.

Customer service is focused on developing both customer satisfaction and customer loyalty. An Internet provides customers with fashion hints and these are supported by in store displays that offer 'ensemble' ideas. Staff identify with customers demographically and in fashion appeal.

7. Concluding comments

This paper has attempted to identify the changes occurring in the business environment and to discuss their implications for Australian business by using examples of organisations that have identified change and the opportunities that change offers. Typically this requires new approaches to strategy, structure (particularly the acceptance of inter-organisational relationships) and operational implementation of business plans.

It is unlikely that the "good old days" - if that's what they were will return. The realistic organisation is one that will adapt to the new order of business relationships and seek to form network alliances and partnerships within and outwith national boundaries. Each of the companies referred to have embraced some, if not all, of the

developments in knowledge management, technology management, process management, and relationship management to restructure their businesses around the most important feature of their business the customer.

The opportunity to create value by "shifting" form (product-service format), time, and place to meet marketplace expectations has never been better; but it needs imagination and creativity.

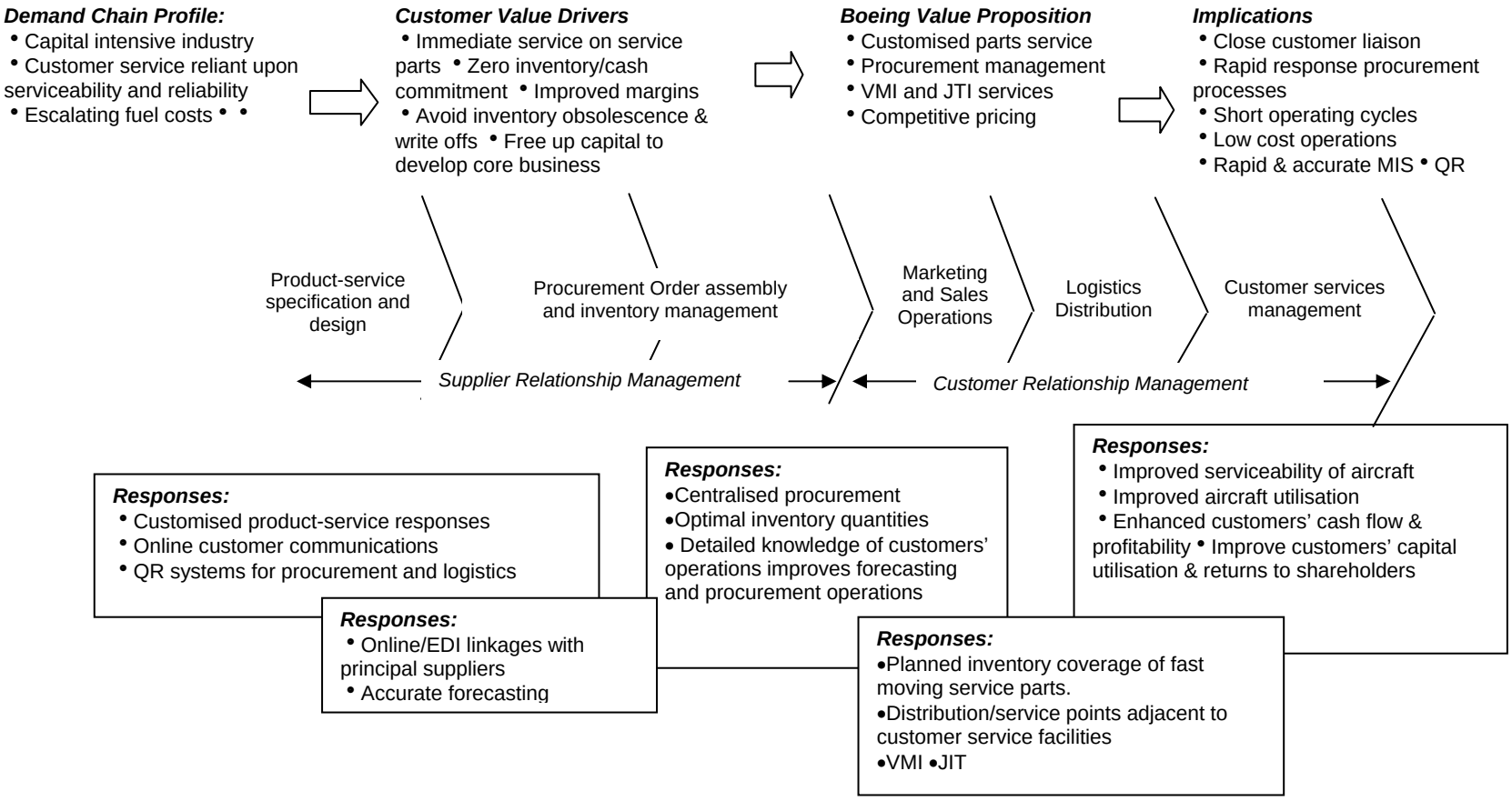

Figure 8: Boeing - Effective demand chain management leads to effective and efficient response management

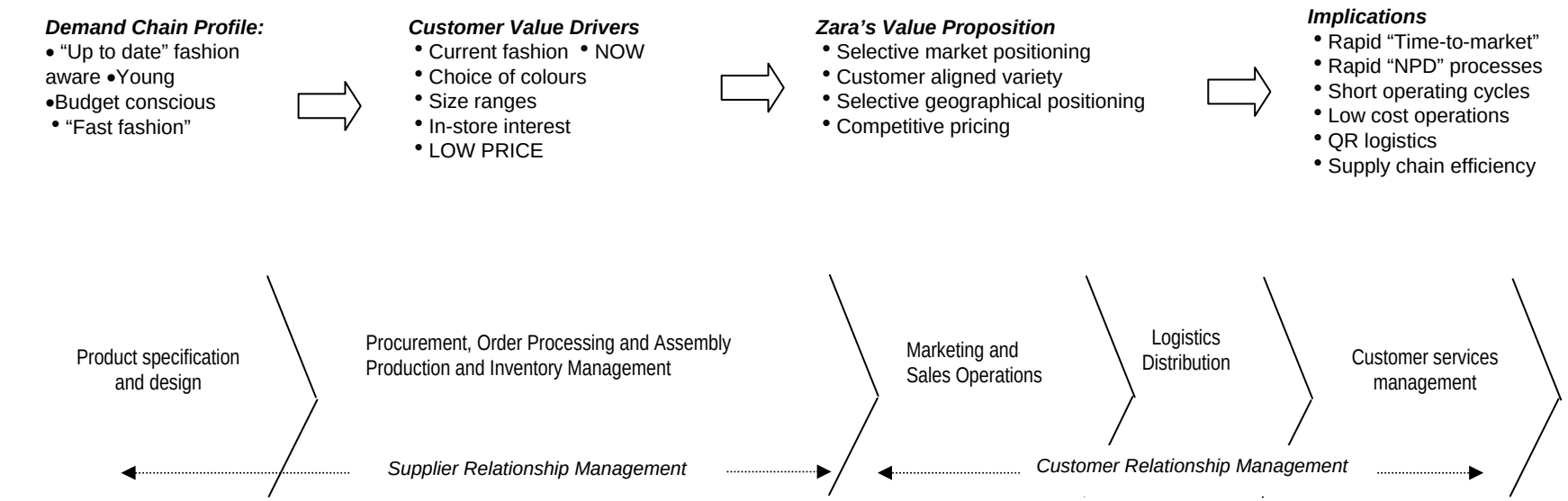

Figure 9: Zara - effective demand chain management leads to effective and efficient response management

References

Ashton J (2008), “Hidden gem of manufacturing”, The Sunday Times, 29 June

Birtwhistle G N Siddiqui and S Fiorito (2003) “Quick response: perceptions of fashion retailers”, International Journal of Retail & Distribution Management, Vol 31 Number 2 (2003)

Friedman T L (2006), The World is Flat: the Globalized World in the Twenty First Century, Penguin Books, London

Godsell J, A Harrison, C Emberson and J Storey, (2006) “Customer responsive supply chain strategy: An unnatural act?”, *International Journal of Logistics,* Volume 9, Number 1 / March

Grey B (2006), IMS (Intelligent Manufacturing Systems) Vision Forum 2006

Harrigan, F., (2006), “Integrating theories of boundary choice: a case from the global aircraft industry”, *The International Conference on Coordination and Cooperation across Organizational Boundaries,* University Cattolica Sacro Cuore, Milan,

Heller R, (2001) “ Inside ZARA”, *Forbes,* NY

IMS (Intelligent Manufacturing Systems) Vision Forum 2006

Fung K, Fung W and Y Wind (2007), *Competing in a Flat World,* Wharton School Publishing

Manu*future*-EU, 2006

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

Lee H L (2004) “The triple a supply chain”, *Harvard Business Review,* October

Li and Fung: www.lifung.com

Manufacturing and Business Technology (2007)

McClenahen J (2004), www.industryweek.com, 1 August

MacMillan, I C and McGrath, R G (1997) "Discovering New Points of Differentiation", *Harvard Business Review*, July/August.

Mentzer J T (2006) “A telling fortune”, *Industrial Engineer*, April

Mortishead C (2008) “Rising transport costs hammer globalisation”, (The Times, London) reproduced in *The Australian,* 12 June

Myers J (2006), IMS (Intelligent Manufacturing Systems) Vision Forum 2006

Normann R, (2001), *Reframing Business,* Wiley, Chichester

Omahe K (2005), The Next Global Stage: the Challenges and Opportunities in our Borderless World”, Pearson Education, NY

Phelps B (2004), “Smart Business Metrics”, FT Prentice Hall (Pearson), Harlow, UK

Porter, M.E. (1996), “What is strategy?” *Harvard Business Review*, November/December

Rainbird M (2004), "Demand and supply chains: the value catalyst", Special Issue: The Value Chain, *International Journal of Physical Distribution and Logistics Management*, Vol 34, Issue ¾

Rohweder C (2004),"Style & Substance: Making Fashion Faster; As Knockoffs Beat Originals to Market, Designers Speed The Trip From Sketch to Store", *Wall Street Journal (Eastern Edition)*, New York, 24 February

Seely Brown and J Hagell III (2005), "From push to pull: The next frontier of innovation", *McKinsey Quarterly*, Number 3

Slywotzky, A.J. and D. J. Morrison (1997), *The Profit Zone*, Wiley, New York

Stank T and J Mentzer (2007), "Demand and Supply Integration: A Key to Improved Firm Performance", Industry Week Value Chain eNewsletter, 17 December

Tagliabue J (2003), "Spanish fashion chain Zara rivals Gap by operating like Dell', *New York Times*, 9 June

Tierney, S (2003),. Tune up for a super-efficient supply chain with a Triangle. *Frontline Solutions*, (Pan-European edition), Duluth: Jun 2003.

Walker B, D Bovet and J Martha (2000), "Unlocking the Supply Chain to Build Competitive Advantage", *Journal of Logistic Management*, Vol 11 No 2

Walters D and M Rainbird (2007), *Strategic Operations Management: a Value Chain Approach*, Palgrave/Macmillan, Basingstoke, UK

Waugh (2008), *The Australian*, 17 June