



WORKING PAPER

ITLS-WP-11-13

**The logistics implications of
emerging business models.**

By

David Walters

July 2011

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-11-13

TITLE: **The logistics implications of emerging business models.**

ABSTRACT: The network structure has expanded the nature of organisational economics from a limited perspective, based upon economies of scale (within which the firm became volume oriented striving to achieve its minimum cost/volume position on its long-run average cost curve (Chandler: 1962), to a ‘collective’ perspective based upon a notion of dispersed operations (i e, the complete range of value creation, production, delivery and service provision). It is no longer sufficient to be the *lowest cost provider* in a market but rather it is now essential to be the most effective and efficient *solution provider*: end-user markets are product-service dominated. These may be PRODUCT-service markets, however in the New Economy many industrial markets are product-SERVICE markets: the customers are aware of product application performance but are often more influenced by *service-maintenance availability* rather low prices, hence the approach by major manufacturers of such products as aero-engines which are priced by the hour of serviceable use. To be effective it is essential that suppliers and customers understand each other’s expectations (value drivers) and costs (value driver response costs). The complexities of markets encourage a network approach, one in which “solutions” to customers’ “problems” may take on a PRODUCT-service format or (increasingly) a product-SERVICE offer and the solutions will cross a number of international borders as well as a number of intra and inter-organisational boundaries during the process.

KEY WORDS: *Business models; globalisation regionalisation collaboration value drivers; value added; productivity profitability.*

AUTHOR: David Walters

CONTACT: INSTITUTE of TRANSPORT and LOGISTICS STUDIES (C37)
The Australian Key Centre in Transport and Logistics Management

The University of Sydney NSW 2006 Australia

Telephone: +612 9351 0071
Facsimile: +612 9351 0088
E-mail: business.itlsinfo@sydney.edu.au
Internet: <http://sydney.edu.au/business/itls>

DATE: July 2011

1. Introduction

1.1 *The factory of the future*

Changing stakeholder expectations have clearly brought about changing patterns of corporate responses. In Europe and the Asia/Pacific regions the growing power of the emerging or newly developed economies has evoked positive responses. The *Manufuture*-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. In the subsequent “*Agenda*” a number of concerns were expressed. The report identifies two major threats to European manufacturing. 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.

Manufuture 2006 considered 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 *Manufuture* 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 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, Manufuture-EU, 2006

In many situations the *Manufuture* prediction is more a confirmation that present trends will continue and the network based business model is becoming well established, as the examples above suggest. **Table 1** identifies a number of changes that are currently influencing the emerging business model; of interest here is the response to *value migration* and to *distributed operations*. A characteristic of value migration is that it results in a repositioning of the production of ‘market value’. 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”.

Table 1: Characteristics of the emerging business models

Traditional Approaches Was/Are	New Approaches Are/Becoming
Command	Integration
Control	Coordination
Vertical/hierarchical structures	Holistic/virtual structures – distributed operations
Static processes: slow or nil responses to market or production process changes	Dynamic processes: rapid responses to value migration
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*

Many of the concepts in Table 1 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 (2004) (Bell and Lucent working a 24 hour shift across China, India and the US) is an example of super-optimal productivity. Interpreneurship identifies the business management skills that integrate and coordinate networks of organisations.

Barkai and Manenti; (2011), suggest current market trends require the future production environment to be highly adaptable and reconfigurable to respond to rapid changes in market demand, technology innovation and changing regulations. Flexible manufacturing technologies employed by most automakers are a critical ability in this process and the foundation for profitable growth, but these alone will not suffice in a long term strategy to fend off the competition. The authors suggest a practical “design anywhere, make anywhere, sell anywhere” strategy is needed, and propose, arguing that:

“Factories of the future will be a global network of production facilities managed as single virtual factory. This type of manufacturing network consolidates multiple resources and capabilities to form an end-to-end fulfilment network that we call fulfilment execution system (FES).”

FES is an approach to a coordinated management of demand, capacity and resources, and outbound order fulfilment across the entire network of manufacturing plants and along the supply chain. The authors’ proposal relates to the regional-consolidation model; data gathered will be connected to corporate-level intelligent decision support tools, creating visibility and intelligence on operational data. It enables manufacturers identify problems, isolate root causes, understand the state of execution processes, and adopt corrective actions quickly across multiple plants. The authors’ proposal takes us beyond the marketplace/marketplace work by Rayport and Sviokla (1994) in which they suggested the traditional marketplace interaction between physical seller and physical buyer are being eliminated. Zuboff (2010) argues that for many goods and services, new business frameworks are emerging: federations of enterprises—from a variety of sectors—that share collaborative values and goals are increasingly capable of

distributing valued assets directly to individuals, enabling them to determine exactly what they will consume, as well as when and how. This shift not only changes the basis of competition for companies but also blurs—and even removes—the boundaries between entire industries, along with those that have existed between producers and consumers.

1.2 Additive manufacturing: “Customisation becomes a reality

The Economist (2011) explored the world of the *fabricator*, the application of 3D printing technology to manufacturing. Designers and Engineers have been using 3D printers for more than ten years; initially to produce prototypes rapidly and at low cost. Currently they are now capable of using a wider range of materials (plastics and metals) and their accuracy is been developed such that it is estimated that more than 20 per cent of the output from 3D printers is now final products and this estimated to have increase to 50 per cent by 2020.

It is likely that Additive Manufacturing will have a major impact in the value chain network by lowering both fixed and variable costs. The equipment (the fabricator) now costs less than a laser printer did in 1985, it is compact and does not require anywhere near the production facilities currently in use producing similar products. Savings in variable costs are realised by the savings in raw materials, where it is estimated 3D printing uses some 10 per cent of input materials.

The Economist argues that: “The industrial revolution of the 18th century made possible the mass production of goods, thereby creating economies of scale which changed the economy – and – society – in ways that nobody could have imagined at the time. Now a new manufacturing technology has emerged which does the opposite”. In the mid-1990s *mass-customisation* was offering considerable competitive advantages; now *customisation* offers the potential of not just exclusiveness but of uniqueness. The Economist suggests potential for focusing RD&D in central locations that is linked by ICT to the market place, thereby expanding the notions of Rayport and Sviokla and those of Zuboff.

2. Networked operations: Distributed assets/dispersed manufacturing – developments in technology and relationships

Friedman (2005) discussed the impact of ‘technology’ on the generic business model. He identified three stages of development towards globalisation. Stage one occurred during the period between Columbus’s discovery of the New World and the development of global trade using the transportation technology and rudimentary relationships management of the 15th century. Stage two occurred from 1800 to 2000, when transportation and communications increased in efficiency with significant reductions in costs, and the factory and mass production began to offer products that were affordable to almost everyone. Stage three arrived when the PC and the Internet were established as the conduit that connected people and work units to each other wherever they were located instantly at low cost and with a high level of accuracy using what Friedman labelled as *workflow software*; the result of stage three is that individuals (and organisations) are able to contribute to the production of a product-service project from any location anywhere in the world; this has led to the development of holistic approaches to operations often referred to as *distributed assets and/or dispersed manufacturing*

An example of a distributed asset/dispersed manufacturing business model is Li and Fung, a Hong Kong based value chain network coordinator working with some 10000+ partner organizations in 40 countries, manufacturing a range of apparel products from high quality woollen sweaters to synthetic slacks: Li and Fung sit at the hub of a network of specialist enterprises that mobilize resources in different combinations depending upon the rapidly changing demand and coordinate a response. Li and Fung have undertaken an *interpreneurial role* by integrating and coordinating the productive capacity of these organisations. The

aerospace industry shares a similar structure; Boeing Aircraft uses some 900 suppliers based in seventeen countries worldwide in the construction of the 777 aircraft. (www.Boeing.com/commercial/777family/pf/pf_facts.html). The number of suppliers for the 787 is reportedly higher and has been responsible for much of the delay in deliveries; Boeing also changed their partnership agreement terms expecting them to undertake much of the R&D tasks – this has not materialised.

Another model finding support is the original-design manufacturer (ODM), a model that is based upon product innovation. Taiwan's Compal and Quanta Computer, offer equally compelling examples of distributed product innovation. These ODMs creatively pull together highly specialized component and subsystem suppliers in order to generate ideas for delivering higher performance at lower cost in a broad range of digital devices, including digital still cameras, mobile telephones, and notebook computers. Instead of designing products in detail from the top down, ODMs specify ambitious performance targets and then rely on this diverse network of technology partners to find new ways of meeting them. It has been suggested that the recently introduced iPhone by Apple follows this principle. In each of these examples we see business models that are designed to create value innovation in extended product-service markets.

The growth of network collaboration, globalisation and now regionalisation have introduced an emphasis on profitability and cash flow and it was found that these could be enhanced by extending the boundaries of the organisation to include nationally and internationally based partners. In addition to the changing attitude to structure and location, this move towards networks and organisations being components within these, operating as providers of specialist product-services within specialist markets is significant. **Figure 1** identifies a number of specialist Japanese (medium size organisations) with dominant shares of B2B world markets. In Germany the term *Mittelstand* is sometimes applied to quite small, parochial firms, the most interesting ones are rather bigger and more outward-looking. Most shun the limelight: 90% of them operate in the business-to-business market and 70% are based in the countryside (Economist: 2010). They focus on market niches, typically in areas such as mechanical engineering. *Dorma* makes doors and all things door-related. *Tente* specialises in castors for hospital beds. *Rational* makes ovens for professional kitchens. This strategy helps them avoid head-to-head competition with global giants. It has helped them excel in these market niches. *Mittelstand* companies dominate the global market in an astonishing range of areas: printing presses (Koenig & Bauer), licence plates (*Utsch*), snuff (Pöschl), shaving brushes (Mühle), flycatchers (Aeroxon), industrial chains (RUD) and high-pressure cleaners (Kärcher). Kärcher's dominance of the high-pressure market is so complete that in 2005 Nicolas Sarkozy caused a scandal, after a spate of riots, by calling for a crime-ridden *banlieue* to be cleaned out "*au Kärcher*". Globalisation has been a godsend to these companies: they have spent the past 30 years of liberalisation working quietly to turn their domination of German market niches into domination of global ones.

Critics argue that emerging market companies (China, India, Brazil, etc) will eventually develop similar capabilities and need not depend upon the *Mittelstand* model. Further it is argued that they are too conservative. Counterarguments suggest that the *Mittelstand* model is robust; typically each organisation has a creditable number of overseas subsidiaries; these offer service and technical advice, may deriving their profitability this way. The article cites *Hako* as generating only 20 per cent of its revenue from the sales of equipment. However it is noted that Germany has a poor record in nurturing small organisations into major, world, organisations.

Japan has a number of medium sized organisations – *chuken kigyo* – strong medium sized firms that have a number of these organisations:

Shamano 60/70 % of world's bicycle gears and brakes

YKK 50 % of world's zip fasteners

Nidec 75 % of world's motors for hard disk drives in computers

Mabuchi 90 % of world's micro-motors used to power the adjustment of rear view mirrors in automobiles

TEL 80 % of the etchers used in LCD panels

Covalent 60 % of containers that hold silicon wafers as they are converted into computer chips

Murata 40 % of world's capacitor market (50 % margin)

Japan Steel Works 100 % of the world market for solid steel containers that contain radioactive materials

Economist 7 November 2009

Figure 1: Japans international SMEs

The Economist identifies three 'general lessons'; the Silicon valley type cluster is not essential to succeed; a focus on traditional strengths in established industries appears to be sufficient, A second point is that niche markets can aggregate into large global activities; given the success of GE and Toshiba (below) this is a valid claim. And third; sustained focus on capabilities with innovative products and processes does have rewards. Innovation is emerging as an important issue.

There are other factors – the economics of production and tax and exchange rates. The Economist (2010) reports activities by a number of Japanese organisations to move production off-shore: "Japanese firms do 30% of their manufacturing overseas—twice as much as in the early 1990s. Toshiba's foreign-made share has grown from 52% to 56% in the past year alone. Fuji Xerox and Yamaha Motor boast levels of 80% and 94% respectively. As the yen hits 15-year highs on a nominal basis, there is more pressure to ship operations abroad". The report suggests longer-term factors besides the yen's recent strength. One is productivity. Overseas subsidiaries have profit margins about one-third higher than those of domestic operations, according to the trade ministry. A second is proximity to consumers in fast-growing economies. In 2001 only 40% of Japanese companies' overseas production in Asia went to local consumers. Now the proportion is 62% and growing. The third is tax. Japan's effective corporate tax rate, at 41%, is the highest among G20 countries, and almost twice that of South Korea. Many carmakers have moved production to Thailand not only for low taxes but also because of that country's free-trade agreements (FTAs), which let them export across the region free of tariffs. A fourth is the differential in exchange rates that can be punitive for organisations manufacturing in 'high value' countries and selling their products in countries with deflated exchange values. Nissan announced they intended to increase offshore manufacturing due to the increasing strength of the Yen and its impact on prices in overseas markets. (IndustryWeek/Agence France-Press: 2010)

The Economist report adds: "Losing factories in Japan is particularly pernicious because much of the country's advantage lies not in design but in process—producing at large scale and with a low defect rate. Companies still keep "mother factories" in Japan to refine their production processes and retain skills. But their foreign plants need this mothering less than they used to: three-quarters of Japanese-owned foreign plants were at the same technical level as domestic ones in 2008, up from about half in 1996."

3. New competitors, new “rules” and shrinking time horizons

An indication of how “new rules” are appearing in the new economy markets is indicated by a recent edict by the Chinese government. China is debating a 10-year plan that sets rules on how foreign auto makers transfer key technologies to China if they opt to produce and market EV cars and plug-in hybrids there. It is reported that Beijing is considering a 10-year plan that aims to set rules and regulations on how foreign auto makers transfer key technologies to China if they opt to produce and market electric cars and plug-in hybrids there. A draft of the plan suggests Beijing could compel foreign automakers that want to produce electric vehicles in China to share critical know-how by requiring them to enter joint ventures with Chinese firms, some executives say. It also limits foreign firms to minority stakes in any alliances that are created. www.industryweek.com (2010)

“Schumpeter” (2011) reviews the business models of the ‘Emerging Markets’; noting that the ‘BRICS’ recovered from the 2008 financial crisis far quicker than the traditional Western companies and that many of them are leading the ‘growth by acquisition’ activity. The article reports on a study by BCG of some 100 BRIC companies they report revenues growing (on average) at 18 per cent per year (three times faster than non-financial companies in the S&P 500. They have managed to expand fast without diluting their profit margins (which at 18 per cent were 6 per cent higher). BCG argue that these results are because they have managed to resolve the trade-offs usually associated with corporate growth between of volume against margin; rapid expansion against low leverage (debt), and growth against dividends. They have increased sales three times faster than traditional global operators and have reduced debt/equity ratios by some three-percentage points, and have achieved a higher dividend/share price ratio every year apart from one. There were exceptions: the pharmaceutical industry (that primarily focused on low margin generic drugs and the consumer durables manufacturers that focused on low-cost products, avoiding the high price segments). BCG suggests these could be exceptional performances in exceptional times as the BRIC competitors ‘catch-up’.

To achieve *sustainable competitive advantage* in the New Economy requires ‘an innovative business model requiring considerable investment’; even this does not necessarily guarantee success, rather it puts the firm in the ‘qualifying category’. As the business environment becomes increasingly influenced by global events and sustainability priorities there is no guarantee that the innovative product-service, delivered by an innovative set of processes supported by unique/exclusive capabilities will succeed in a very competitive global market. *Serial competitive advantage*, offering an order winning value proposition has time constraints. The notion of ‘value migration’ having impact through new business models offering more cost-efficient value delivery to customers, or reducing the purchase price for the same purchase value is a constant threat. Serial competitive advantage seeks to extend the time horizon by creating collaborative networks with target market segments in mind; network structures can be organised to ensure that ‘incremental differentiation’ can be incorporated into the value proposition. Many organisations accept ‘order qualifying’ status and *competitive necessity* (rather than work for ‘order winning’ status and *competitive advantage*): their value proposition offering no advantages over and above competitive offers. An organisation offering obsolescent, perhaps obsolete product-services and processes is clearly at a *competitive disadvantage*.

3.1 Globalisation vs regionalisation

The “nineties” was a period of globalisation; the “noughties” was one of moving towards regionalisation. There is an interesting difference of philosophy. During the “noughties” large international organisations realised that their investment in the *emerging markets* created consumer wealth and an increase in disposable incomes, so much so that the ‘providers of low-cost labour’ became consumers of their labours. Initially low labour costs and economies of scale (due to product range management) had strong incentives but the expansion of the

domestic markets increased the attractiveness. As we have seen in recent months automobile sales in China are breaking growth records.

3.2 Globalisation: Approaches

It is interesting to observe diverging business models as companies such as Ford Motor Company are developing further towards continuing with a move to global platforms that streamlined the way the company builds cars for markets worldwide and is one of the key cost restructuring initiatives that helped return the Dearborn-based automaker to profitability. At Ernst & Young's Strategic Growth Forum on November 10, 2010, at which Executive Chairman Bill Ford discussed his company's turnaround and other key auto industry and manufacturing issues. The company's move away from building cars uniquely for individual countries along with successful collaboration with its union leaders has brought costs down significantly and the company's latest Ford Explorer model is being built in Chicago and will be exported to 93 different countries. The plan is to continue to export from the U.S. to around the world pursuing a "One Ford" global design and development strategy with only small adjustments for local tastes. **Figure 2**, describes this global business model being used by Ford and other large international organisations. The new Ford Focus will be built on one platform and will have the same engine, transmission, chassis and main body in all markets where it is sold; Katz J (2010), Whirlpool acquired the home laundry assets of Philips NV recently to pursue a similar strategy. A recent article from *Knowledge@Wharton* suggests that large organisations are aware of the "two-speed world" and are adapting their business models to accommodate the changes. General Electric is one of the most reported examples but other companies in other industries are adapting to the challenges. An important cost issue here is what the traditional cost models can continue to offer. The Wharton report cites comments from the Boston Consulting Group's Asian operations.

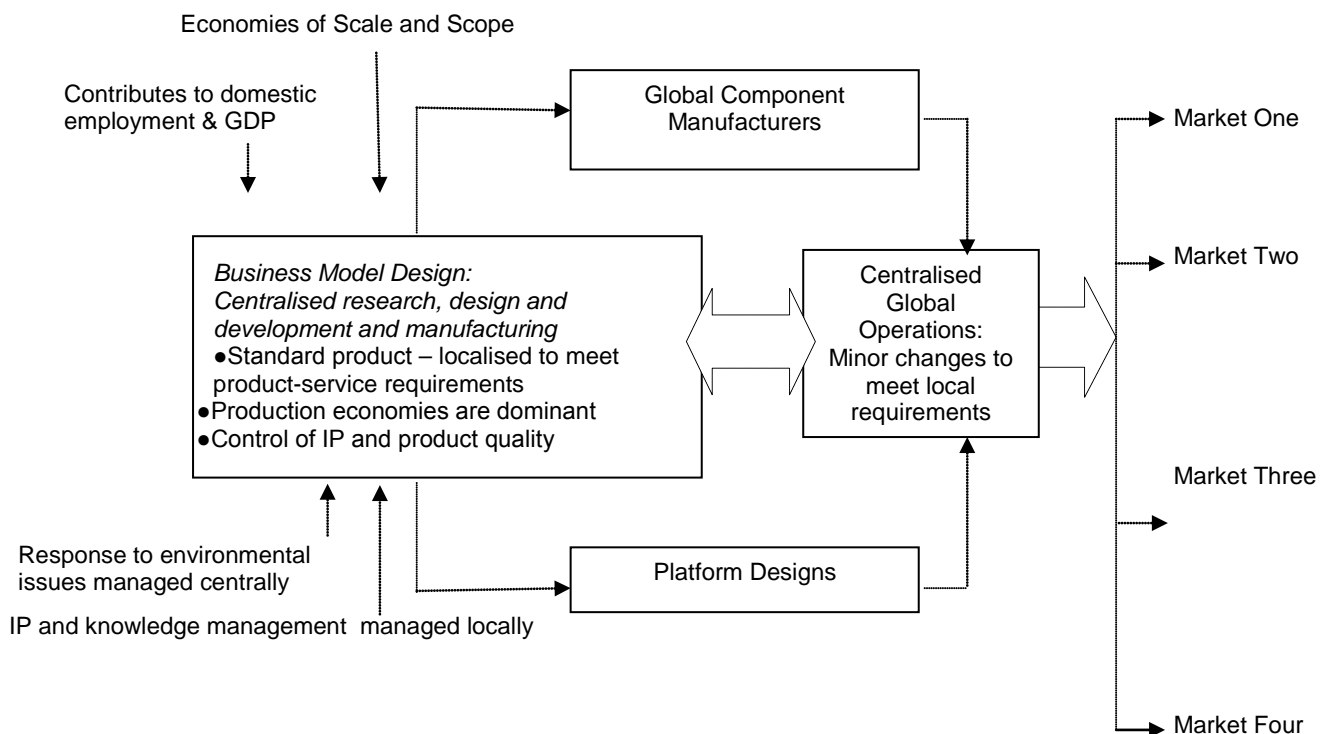


Figure 2: Global operations business model automobiles and consumer durables

These suggest they are identifying opportunities to marry the global/regional manufacturing opportunities by designing production processes that can be conducted on the same assembly lines initially; for example, automobile manufacturers are able to manufacture platforms and sub-assemblies (such as partly completed chassis products and in pharmaceutical manufacturing producing the intermediate chemicals. Other industries (mobile phones) are using economies of scale to produce kits of basic parts.

3.3 *Regionalisation: Approaches*

Regionalisation is increasing. It is becoming clear to a number of organisations that re-engineering products to reduce costs is not as effective as redesigning them to meet local requirements and to be manufactured locally to create goodwill and to take advantage of reductions in costs. General Electric (Healthcare) is practising *reverse innovation*, best described as:

“Offering a ‘fifty percent performance solution’ at fifteen percent of the cost of the one hundred percent solution”. Immelt and Govindarajan (2009).

Because:

- Local market needs in these markets is less sophisticated
- Local manufacturing resources exist but are also less sophisticated
- Local distribution and service support resources exist and can be used
- ‘Reverse technology transfer’: capabilities and processes to move the innovation into suitable markets in rich countries is more effective than attempting to modify and manufacture products for these markets in domestic locations.

GE introduced *reverse innovation* because it found that the traditional approach of developing sophisticated products in domestic markets and simplifying them for emerging markets was not effective primarily because of declining growth rates in developed markets and innovative competitors in the emerging markets. GE introduced a business model based upon five principles:

As a result LGTs were established in India and China. The following management model was created

- Product-service strategy is delegated to LGTs (Local Growth Teams) by localising/shifting decision making to sourcing/consumption markets
- Reflects local circumstance in planning processes: opportunities and constraints
- LGT structures reflect local realities
- ‘Objectives and strategies become ‘customised’ to meet local (realistic) possibilities and constraints:
 - Awareness and applications of product-service attributes.
 - Current practices.
 - Complexity of product and processes.
 - Controlling the LGT.
 - Mediating any conflict with global business.
 - Managing resource requirements and allocation by connecting LGT with global R&D and capital sources.
 - Managing the transfer of the innovation into ‘rich countries’ developed markets.

It is interesting to note that these “basic” products do have markets in the traditional markets.

Panasonic's EM-WIN program operates in 'BRIC', and other emerging markets (Brazil, Russia, India, China, Vietnam, Mexico, Indonesia, Turkey & Balkans). It estimated that sales to EM-Win markets will exceed sales to North America and Europe. EM-WIN has been a major activity for Panasonic over two years (2007/9). Countries. Panasonic undertook 'Lifestyle research' in order to redesign products to meet local requirements – reduced features and reduced manufacturing costs. By reducing features and localising design and manufacturing, costs can be reduced to reach acceptable prices: pricing targets are television \$US50, air conditioners \$US100, washing machines \$US200. Eliminating features simplifies the manufacturing processes & requires fewer parts and permits the introduction of standard parts and platforms. Local production and contract manufacturing contains costs. It requires the re-design of products and processes in order to reach realistic cost levels. Japanese designs cannot be extended to EM-WIN, currently this is repurpose design and innovation caused by product life cycle shrinkage. Panasonic will need to perform a complete overhaul of how it conceives, designs & manufactures its products. Panasonic expects EM-Win to increase sales of consumer products by almost 20 per cent. Wakabayashi D (2009) WSJ.com, The Australian, 10 July. By contrast Apple designs its products in the US and manufactures them in Asia; this is a viable strategy as the products are standard wherever they are sold. Clearly the economies of scale adequately compensates for the additional logistics costs involved. *Knowledge@Wharton* (2011)

Toyota has indicated its preference for regional activities; it will invest nearly \$700 million in its first fully-fledged research and development base in China in a bid to expand its share of the world's largest auto market. Toyota Motor Engineering & Manufacturing (China) Co. Ltd. will build the plant at an economic development zone in Changshu, near Shanghai, with plans to begin operations in the spring of 2011. The new company will survey the Chinese auto market, study quality control at its local assembly plants and develop low-emission vehicles and engines for the local market. The company plans to raise the number of employees from an initial 200 to 1,000. "TMEC ... aims to tailor vehicles to the demands of Chinese consumers," Agence-France (2010)

Regionalisation offers an opportunity to identify, and accommodate, local customs and culture, local governance regulations (pharmaceuticals), patent laws, packaging requirements, and, distribution processes and practices. Regionalisation has taken international organisations well beyond identifying and using low labour costs but has introduced a requirement to understand *all of the costs* that are involved, such as logistics, quality control and the costs of failing to meet *time demands* of customers – that can result in lost sales and reduced margins.

An interesting dimension to globalisation vs regionalisation strategy was added by Nissan chief executive Carlos Ghosn who announced the Company's intention to move production and support functions to dollar-linked economies, including the United States and China, to avoid currency volatility; the company wants to correct a "big imbalance" in its costs and revenues due to making cars in Japan that are then sold in the United States and dollar-linked economies in Asia and to shift more of our cost from a yen base to a dollar base. Ghosn's remarks come amid fears that tensions over global trade imbalances could degenerate into a series of beggar-thy-neighbour devaluations as countries seek to gain a trade advantage from a cheaper currency. Ghosn told the Financial Times(2010) that exchange rate volatility of any kind was damaging to business because it undercut long-term strategy. "The only way you can protect yourself is by making sure your currency footprint is balanced. If there is any imbalance, it should be small".

Renault-Nissan is developing an alliance in Russia, where it has been invited to raise its stake in Avtovaz, the manufacturer of the Lada, to up to 50%. Renault currently owns 25% plus one share of the struggling Russian automaker. Asked if he would accept Putin's invitation, Ghosn's reply indicated that Renault are going to put in a lot of technology, develop a lot of capacity, do a lot of things together between Avtovaz Lada, Renault and Nissan

Unilever is reported to be very successful with a regional approach in India where they have replaced conventional marketing expenditures with consumer education and distribution spends,

they found the population was not familiar with bottles containing consumer products and they have established a marketing channel based upon stores run by women in local villages as a response to the “informal economy” that persists with a large number of small roadside shops. *Knowledge@Wharton* (2011). **Figure 3** identifies a typical regionalised corporate business model.

3.4 Collaborative networks

Some companies are learning how to take a more creative approach to mobilizing resources. Grey (2006), discusses collaboration from a resource management perspective; arguing that rigid resource based systems, typically highly automated factories operating with rigid and standardised processes that apply resources to specific places at predetermined times, are becoming obsolete. See **Figure 4** Grey’s argument is that resource mobilisation (the increasing externalisation of tasks and a corresponding increase in cooperative arrangements or networking.) is; “a necessary response to fragmenting less predictable demand. The Bishops Technology Group (Grey’s company) collaborates with partners across the world to develop new innovative products. Grey 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 giving valuable input about the efficacy of product design, and distributor and customer response. This suggests a major difference between *rigid resource* systems and *mobilised resource systems*. Rigid resource systems are the traditional manufacturing model in which production is based on sales forecasts and products when finished are moved into a finished goods inventory that is awaiting sale – it is what has become to be known as the *push approach*.

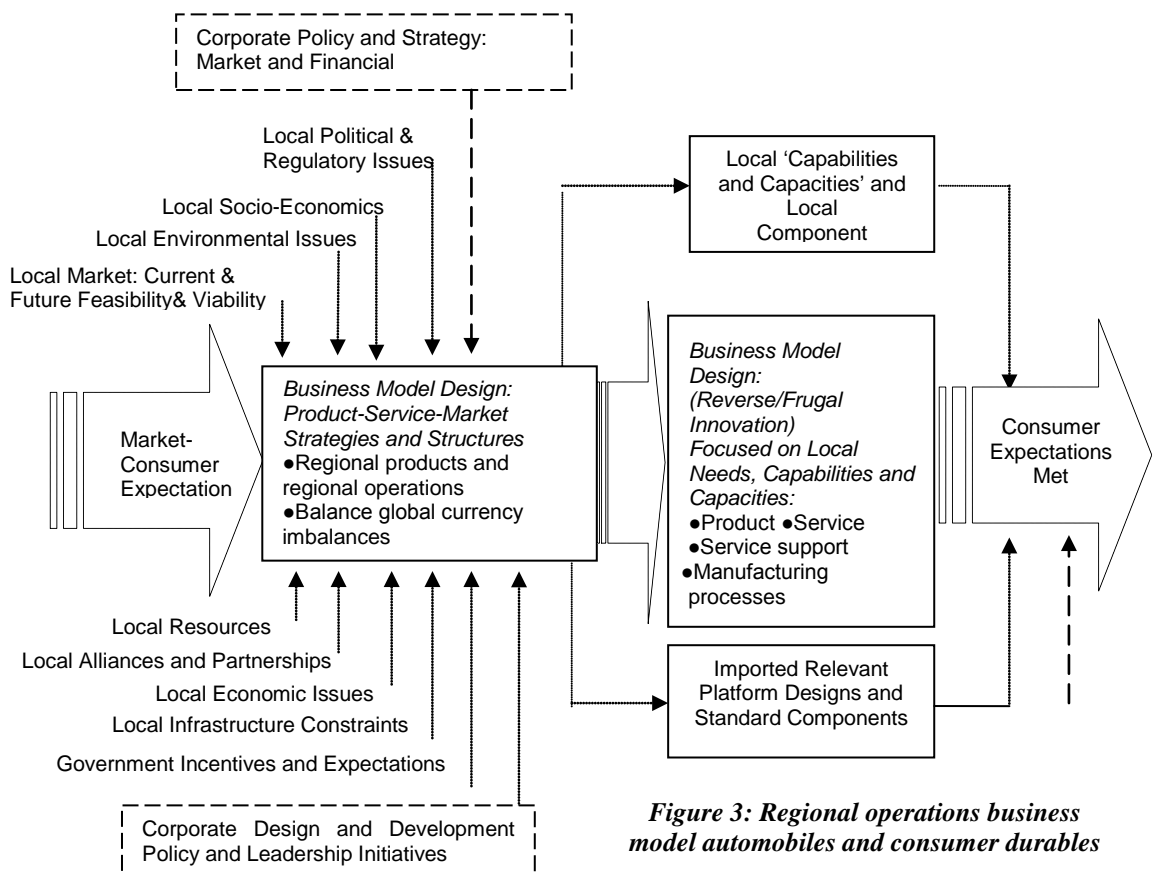


Figure 3: Regional operations business model automobiles and consumer durables

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 - the *pull approach*. Examples of *process platforms* are seen in Internet merchandisers such as Amazon and e-Bay.

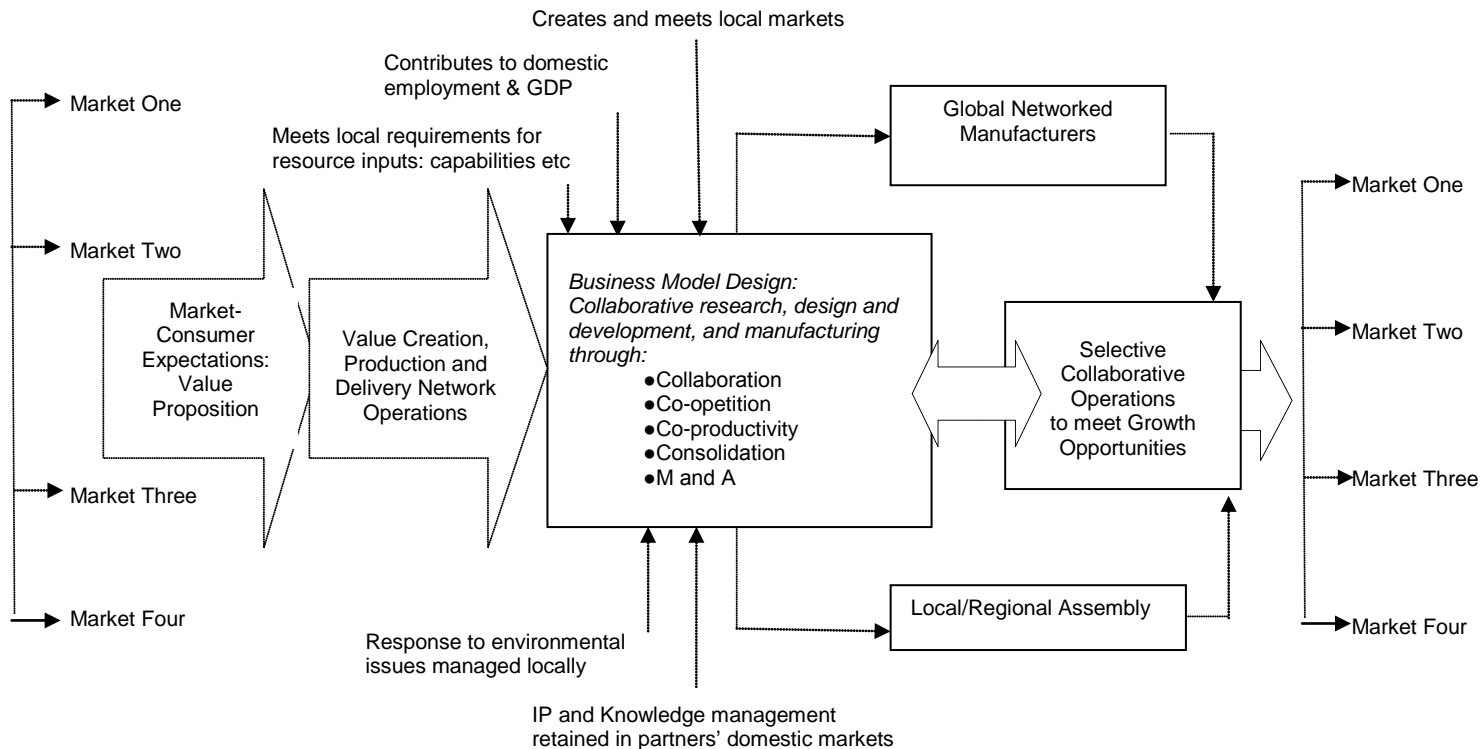


Figure 4: Collaborative networks consumer and consumer durables

3.5 Organisational considerations of globalisation, regionalisation and collaboration: From intra-organisational management towards inter-organisational management

The growth of globalisation and now regionalisation have extended the boundaries of the organisation to include nationally and internationally based partners. In addition to the changing attitude to strategy, structure and location, the move towards organisations as being partners within networks, operating as providers of specialist product-services within specialist markets is significant. There are examples of SME organisations competing in this role.

In Germany the term *Mittelstand* is sometimes applied to quite small, parochial firms, the most interesting ones are rather bigger and more outward-looking. Most (some 90% of them) operate in the business-to-business market and 70% are based in the countryside (Economist: 2010). They focus on market niches, typically in areas such as mechanical engineering. *Dorma* makes doors and all things door-related. *Tente* specialises in castors for hospital beds. *Rational* makes ovens for professional kitchens. This strategy helps them avoid head-to-head competition with global giants. It has helped them excel in these market niches. *Mittelstand* companies dominate the global market in an astonishing range of areas: printing presses (Koenig & Bauer), licence plates (*Utsch*), snuff (*Pöschl*), shaving brushes (*Mühle*), flycatchers (*Aeroxon*), industrial chains

(*RUD*) and high-pressure cleaners (*Kärcher*). Globalisation has been a godsend to these companies: they have spent the past 30 years of liberalisation working quietly to turn their domination of German market niches into domination of global ones.

Japan also has a number of very successful medium sized organisations – *chuken kigyō* – *strong medium sized firms* that have a number of these organisations: *Shimano*, 60/70 % of world's bicycle gears and brakes: *YKK*, 50 % of world's zip fasteners: *Nidec*, 75 % of world's motors for hard disk drives in computers: *Mabuchi*, 90 % of world's micro-motors used to power the adjustment of rear view mirrors in automobiles: *TEL*, 80 % of the etchers used in LCD panels: *Covalent*, 60 % of containers that hold silicon wafers as they are converted into computer chips: *Murata*, 40 % of world's capacitor market (50 % margin): *Japan Steel Works*, 100 % of the world market for solid steel containers that contain radioactive materials

It is certain that the “New Economy”, whatever format that it eventually takes, will be influenced by this business model format and it is noticeable that in those countries where manufacturing rapidly migrated to Asia as it became industrialised (to the extent that it now dominates a number of sectors) there are signs (such as those suggested by the *Mittelstand* model) that being part of a value chain network can reduce the exposure to *high volume/low value* competition and that profitable opportunities do exist. The Economist article identified three ‘general lessons’: the Silicon valley type cluster *is not* essential to succeed; a focus on traditional strengths in established industries appears to be sufficient, A second point is that niche markets can integrate into large global activities. And third; sustained focus on capabilities with innovative products and processes has rewards. It can be argued that by identifying a specific customer ‘solution’ corporate size and distance are becoming irrelevant. Indeed if this is a core ‘need’, one shared by most members of an industry it is very likely that economies of scale will return in importance.

This may be more difficult than it would appear. Majocchi et al (2010), offer an interesting view of current issues and future prospects. In a presentation in New York (10 October 2010) the “Challenges of global manufacturing: improving North American and European competitiveness through cooperation”, they identified a number of issues. There is reluctance among NA manufacturers to pursue global growth opportunities particularly in the emerging BRIC economies where dramatic growth is expected as “hundreds of millions” of consumers continue to expend. However this growth may well not be matched by manufacturing capacity. The authors comment on a survey by HSM Americas Inc, suggesting that while European manufacturers have learned how to serve the diverse needs of customers spread across the globe and have developed the know-how to cooperate with other companies in vertically-integrated value chains, North American manufacturing companies, especially small and medium sized enterprises, have not responded similarly and need to refine production capabilities for mass customisation in order to explore the potential overseas. This includes taking advantage of green technologies – before regulations require it – which can help establish a competitive advantage in the global marketplace. These comments suggest that very few organisations in North America would embrace the future predicted by Zuboff.

Some major differences between European and North American organisations were found. European manufacturers expressed a greater interest in increasing their production flexibility to attract business than their North American counterparts, who were more focused on reducing labour costs in the last two years, to offset economic challenges. In addition, fewer North American manufacturers were investing in innovation or R&D than the Europeans. And green manufacturing initiatives, which can help drive down material costs and spur needed innovation, were embraced in greater numbers in Europe than in North America. The authors suggest some guidelines to initiate a move towards both effectiveness and efficiency: strengthen mass customization capabilities, leverage the power of partnerships, and, take a chance and learn about export opportunities. They concluded by commenting that it is a difficult transition, requiring cultural and structural change, adding that waiting is not an option, given the fact that competitors in China, India, Brazil and other emerging economies are moving fast to fill the void.

However, these comments do not necessarily apply to a significant number of “aware” North American manufacturers. Papers at the IMS (Intelligent Manufacturing Systems) Vision Forum 2006 made similar suggestions concerning future activities. Jason Myers (2006), Canadian Manufacturers & Exporters, Canada, identified four ‘agents of change’ for *Next Generation Manufacturing*: customised solutions, a lean approach, ‘the competitive batch of one’, and, “managing time”.

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.

Some examples of Australian companies that are responding to the need to work as a component of an international value chain network includes:

- ***GKN Aerospace & Engineering***; has designed more than 1000 parts for the Lockheed-Martin F-35 Lightning II Joint Strike Fighter
- ***Peregrine Australia***; manufactures a radio frequency sapphire water chip combining antenna and amplifier for ‘top-end’ mobile phones.
- ***GPC Electronics, Sydney***; Superior quality of systems and management (flexibility and complexity) has resulted in negotiated supplier lead times of 2 weeks and order response times for customers of 4 weeks.
- ***Bosch Melbourne***; R&D led customised manufacturing that requires extensive *knowledge IP inputs* provides customers with market exclusivity/differentiation without extensive R&D expenditure
- ***Codan communications equipment supplier, Adelaide***; products based on standard modules reduces inventory holding and order lead times providing a 5/10 day order response time in comparison with competitors’ 4 weeks or more.
- ***GPC Electronics, Sydney***; superior quality of systems and management (flexibility and complexity) has resulted in negotiated supplier lead times of 2 weeks and order response times for customers of 4 weeks.

International examples of collaborative strategies are also available and include:

- Endo Pharmaceuticals/UPS (Healthcare Division): After acquiring DuPont’s drug division positioned itself in the VCN to distribute prescription and other drugs in the US from contract manufacturers in overseas locations. Endo has a partnership in which leases space and UPS’s expertise at handling controlled substances
- Lego launched a “Classroom of the Future” project with US university to teach children about science & technology; launched “LegoFactory.com” a “Lego Digital Designer” that offers an opportunity to design and order a unique Lego model, and; a joint venture with the MIT Media Lab that introduces robotic Lego
- Dow Chemical: locates manufacturing close to the cheapest sources of energy (Middle East & Russia) and from where it can contain the supply chain costs in servicing ‘booming’ markets in Asia and China
- Philips: team up with academic & industry with comparable research interests and capabilities to work on industry standardisation and technology developments

- TomTom (GPS): identified its capabilities to be in ‘innovating’ in a particular area of technology and its understanding of consumer needs in the area. It established a manufacturing outsourcing capability – rather than a manufacturing expertise
- Hewlett-Packard: Outsources 90 percent of its manufacturing volume to some 40 suppliers. HP’s core capability is now focused on ‘managing contract manufacturing
- UPS Inc: provides resources that enables both small (and some large) organisations to operate as large organisations in large global markets. Linking up eBay and PayPal with UPS processes to enable purchases to be tracked during delivery. Managing all of the repair service processes for Toshiba in the US. A complete redesign of Ford Motors’ distribution system in North America to reduce inventory holding reducing the inventory cycle from one month to ten days and improving the accuracy of orders/deliveries.

3.6 *Product-service commoditisation*

A trend of the “noughties” was to offer intangible product-SERVICES to customer organisations rather than tangible hardware PRODUCT-services. These companies bundle software and services into a *solution* focused service product. IBM has been successful with this approach; it can offer more value to customers than they can create from stand-alone products. Solutions are a form of controllable outsourcing that allows them to focus on their core business. For suppliers solutions are an alternative to products that commoditise rapidly. A challenge for supplier is to re-structure the organisation to package and deliver solutions. Galbraith (2002).

Product-service commoditisation is an increasingly common characteristic in both B2B and B2C markets. For example, laptop/notebook computers have become commodities. There is fierce competition at low price ranges reflected in the fact that Wal-Mart and other large retail multiples are offering them in their non-food ranges. Initial innovation positions the product as a PRODUCT-service as it offers new solutions to ongoing problems by improving productivity either by increasing performance (solution accuracy, reduced processing time, adding application processes etc); or by reducing ownership/acquisition costs. Eventually these product and service features become competitive necessities and, furthermore, there are usually a number of ‘imitator’ versions available.

The innovator response is to reposition the problem solving characteristics and to emphasise the product-SERVICE aspect of the offer. Commoditisation leads to competition from expanded uses, increased imitators, price-led differentiation, mass distribution and typically lower levels of service. Process innovation adds low cost/high volume competition and limited features.

Initially both PRODUCT-service and product-SERVICE innovations offer IP led solutions and these are more likely to appeal to B2B customer markets; both are likely to be customised solutions. As customer awareness increases and applications are expanded platform technology permits the continuation of exclusivity *and* the ability to reduce cost, which may be passed on as lower prices or retained to recoup the IP investment as mass customisation and innovative customer service management expands opportunities. Marketing’s responsibility is to identify the customer value expectations and create databases that are of relevance to RD&D, operations and distribution and service partners because it is here that customer loyalty can be built. It is also here that customer networks may be investigated.

Imitator competitors can (and do) offer credible ‘low cost alternative products’ if not service and this offer has appeal to a number of those customers for whom commoditisation suggests that products become disposable items of limited life-span with no service requirements and (in B2B markets) are typically costed against the job.

Innovators may find new applications for their product-services; for example soft drinks/bottled water processors have expanded their markets by varying pack sizes and volumes, distribution innovation (vending machines), event promotions (sponsorship of sporting and other events). These opportunities should be identified by ongoing marketing research with existing and

potential customers. Eventually the innovator response accepts that product-service applications reach maturity and focus on a product-SERVICE marketing strategy. Awareness of the inevitable change in market conditions offers advantages. Typically the 'SERVICE' content of the offer is handled by network partners and successful organisations are well aware of the types of changes that will occur in their markets. Vendors that consider their customers' value-in-use profiles are quick to seize upon the opportunity of adopting a product-SERVICE strategy, one in which there can be economies of scale and therefore shared cost benefits with major customers. This may result in a manufacturer developing a division (or subsidiary company) to offer a service facility to customers. Boeing has done this in both commercial and military aerospace markets. Its commercial value proposition offers Boeing users a global routine service facility; working with its airline customers it can position parts inventories in locations where aircraft service requirements become due, this may relieve the customer of planning both flight and servicing schedules so that they coincide. The defence service operates in a similar manner.

As and when, commoditisation becomes significant a PRODUCT-SERVICE strategy based upon reverse (or frugal) innovation is pursued. GE has reported success with its "15/50" reverse innovation strategy in healthcare equipment (Immelt and Govindarajan: 2009). A cautionary note; traditionalists may be resistant to a 15/50 solution in some applications. While this may not be critical (to patient care as opposed to medical practitioners' incomes) it may have an impact that is of healthcare relevance and as such should be an important consideration in market information building.

4. The economics of network organisations

Chandler's (1977) analysis of the development of industry in the USA identifies the role of the vertically integrated business of the early 20th century and the emphasis on *economies of scale*. However Chandler did suggest that it was the *economies of speed* (the ability to coordinate the production sequences) were more critical for manufacturing efficiency. Subsequently *economies of scope* (these exist when the cost of jointly producing a range of products (or managing a process) within one organisation is less than the cost of producing the products separately across independent organisations: tangible and intangible aspects (e.g. manufacturing & distribution and brands, R&D and service)) shared importance with economies of scale in manufacturing

The influence of network organisations has shifted the emphasis to the *economies of added value*, a collective term for responding to customer expectations for added value by the *effective* and *efficient* management of all of the *economies of production operations*:

Economies of scale: Create price advantages through '*managed*' volume of production (Note: Economies of scope involve cost savings from joint production whereas economies of scale involve efficiencies from the production of higher volumes of a given product). *Collaboration curves* (Hagel et al (2009) hold the potential to mobilize larger and more diverse groups of participants to innovate and create new value. In so doing they may also reverse the diminishing returns dynamics of the experience curve and deliver increasing returns to performance instead. Hagel et al (2009).

Economies of Scope: Exist when the cost of jointly producing a range of products (or managing a process) within one organisation is less than the cost of producing the products separately across independent organisations: tangible and intangible aspects (e.g. manufacturing & distribution and brands, R&D and service). They offer variety and choice through "*product platform*" design management.

The Economics of Learning (experience effect): The unit cost of added value to a standard product declines by a constant percentage each time cumulative output doubles.

Economies of Integration: Cost-effective management of overhead through *strategic partnering*. The principle of business integration; linking isolated activities *into a single, integrated* system

that is fast, responsive, flexible and relatively low cost, resulting in a situation in which unit costs decrease as output increases because the activities of the *entire* operation are either increased by optimising and “leveraging” the ownership, distribution and location of assets throughout a value creation system., or that aggregate, investment and operating costs are decreased, or that perhaps both can be realised.

Economics of Coordination: Optimise the costs of transformation, transactions and interactions throughout the value creation network (its fixed and variable cost structures) by establishing a strategy (and a structure) that ensures the tasks required for success are identified and planned, and that they are implemented and managed efficiently; coordination requires that the organisation “does the right things right”!!

Economics of Interaction: The searching, coordinating and monitoring undertaken by organisations for effective and efficient means to exchange products, services and ideas. They occur on an intra-organisational basis as well as an inter-organisational basis. ICT developments continue to enhance the interactive capacity of industries and individual consumers such that it will create new ways to configure businesses, organisational structures and to service customers. Accordingly it will have a major impact on the strategy, structure and competitive dynamics of entire industries.

Economics of Motivation (to commit to network membership and membership continuity): Network structures the optimisation of resources management. Adam Smith suggested that markets are one very prominent mechanism for solving the problems that arise with the interdependencies of specialisation and division of labour. Smith was referring to end-user markets but the comment is applicable to resource markets within networks; a well-functioning network leads to “internalisation” as interdependence implies that one organisation’s choices and actions have an impact on other network members but that it is end-user satisfaction that is the final arbiter and this is a major influence in the price mechanism *within* the network structure.

The Economics of Transaction: Searching, coordinating and monitoring for effective and efficient means/media to exchange products, services and ideas that maximise added value during: developing specifications, searching/sourcing products & services, evaluating alternatives, negotiating with suppliers, coordinating performance commitments, monitoring performance, and, supplier and customer relationship management.

The Economics of Relationships Management: Adding value by working with suppliers, intermediaries and end-user customers to identify cost-efficient value delivery alternatives using: collaboration through; co-productivity, co-opetition and co-creativity (prosumerism).

The Economics of Differentiation/Specialisation: Adding customer value by offering “product-service exclusivity” through customisation and “mass customisation” using specialisation, process and capability collaboration.

Economies of Time Response: Product and service customisation through DTO, BTO and QR operations process management.

The economics of complexity: the success of reverse innovation has identified the benefits of identifying the *appropriate* level of product-service sophistication on production costs *and* in market success.

The network structure has expanded the nature of organisational economics from a limited perspective, based upon economies of scale (within which the firm became volume oriented striving to achieve its minimum cost/volume position on its long-run average cost curve (Chandler: 1962), to a ‘collective’ perspective based upon a notion of dispersed operations (i e, the complete range of value creation, production, delivery and service provision). It is no longer sufficient to be the *lowest cost provider* in a market but rather it is now essential to be the most effective and efficient *solution provider*: end-user markets are product-service dominated. These may be PRODUCT-service markets, however in the New Economy many industrial markets are product-SERVICE markets: the customers are aware of product application

performance but are often more influenced by *service-maintenance availability* rather low prices, hence the approach by major manufacturers of such products as aero-engines which are priced by the hour of serviceable use.

It is certain that the “New Economy”, whatever format that eventually takes, will be influenced by the emerging business model formats and it is noticeable that in those countries where manufacturing rapidly migrated to Asia as it became industrialised (to the extent that it now dominates a number of sectors) there are signs (such as those suggested by the *Mittelstand* model) that being part of a value chain network can reduce the exposure to *high volume/low value* competition and that profitable opportunities do exist.

5. Logistics and value chain management considerations

The role of logistics and value chain management is featured in **Figure 5**. It is a fundamental representation of the collective processes that, combined, represent the overall role of business logistics.

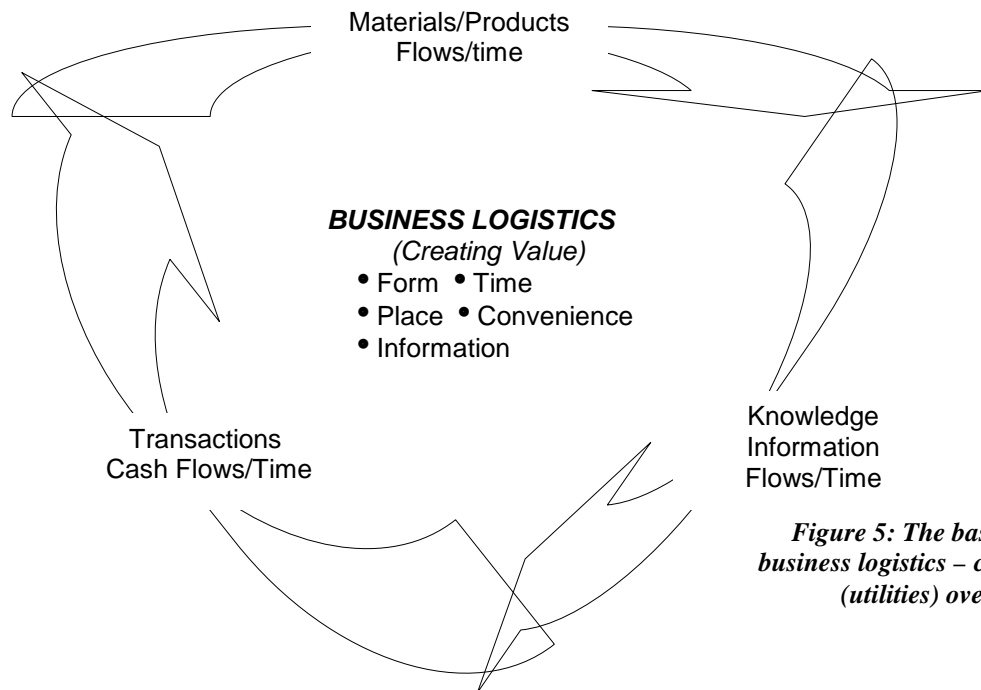


Figure 5: The basic roles of business logistics – creating value (utilities) over time

Any organisation should be able to manage to coordinate the flows of materials/products, knowledge/information and cash/transactions and therefore optimise cash flow. The developments outlined in this working paper do not alter this concept; they may impose time constraints, extend distances, and restructure component processes; this is due to product and process innovation.

Logistics (and supply chain management) have both responded in a positive way. They have embraced lean and agile operations processes, moved away from speculation (“push”) strategies towards postponement (“pull”) strategies and are well placed to undertake a future that includes:

- Continuing the transition from mass production, through mass customisation towards the “customer of one”.
- Being part of a network that meets customers seeking solutions not simply products.
- Working within manufacturing systems that operate from centralised control hubs.

- The “focal point of manufacturing” moving towards Asia thereby becoming the manufacturing engine of the world with a growth rate two, three even four times larger than the traditional manufacturing world. And a possibility that other BRIC nations will follow this lead.
- Value chains competing with value chains rather than organisations competing with organisations.

References

Agence-France (2010), “Toyota Unveils R&D Unit in China”, www.IndustryWeek.com , 17 November.

Agence-France (2010), “Nissan to Move Production to Cut Currency Risk”, www.IndustryWeek.com, 22 November.

Anonymous (2010) “Nissan Considers Bringing Electric Car Technology to China”, Industry Week, www.industryweek.com, 20 September.

Anonymous (2010), “Japan’s big companies are shipping production abroad”, The Economist, 18 November.

Anonymous (2010), “Nissan to Move Production to Cut Currency Risk”, Financial Times/www.industryweek.com, 22 November.

Anonymous Report (2010), “Nah, no”, The Economist 13 November.

Anonymous Report (2010), “China, India Could Reshape Global Auto Industry”, Industry Week, www.industryweek.com. 10 September.

Buss D (2007) “Winning with Global Value Chains”, Chief Executive, March.

Chandler A (1962), *Strategy and Structure: Chapters in the History of American Industrial Enterprise*, MIT Press.

Chandler A (1997), *The Invisible Hand: The Managerial Revolution in American Business*, Harvard University Press, Cambridge, Mass.

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

Fung F, W Fung and Y Wind (2008), *Competing in a Flat World*, Wharton School/Pearson Education, NJ.

Galbraith J (2002), “Organizing to Deliver Solutions”, *Organizational Dynamics*, May.

Grey B (2006) *Manufuture-EU*, 2006.

Hagel J III, J Seely Brown and L Davison (2009) “Introducing the Collaboration Curve”, *Harvard Business Review*, 8 April.

Immelt J and V Govindarajan (2009), “How GE is Disrupting Itself”, *Harvard Business Review*, October.

infor White Paper (2006): www.infor.com.

Jay C (2008) and Mitchell A (2009), “Pacific Brands got it right when it moved offshore”, *Australian Financial Review*, 31 August.

Katz J (2010), “Bill Ford Sheds Light on Turnaround Success”, *IndustryWeek*, 10 November.

Knowledge@Wharton (2011), “Manufacturing in a Two-speed World”, *PARS International* , 4 February.

Majocchi L, A Sacchi, and L Serio (2010), "North American Manufacturers Missing Out on International Opportunities", Viewpoint: IndustryWeek, 16 November.

Multinational companies need new "scale at speed" approaches to penetrate the developing world's increasingly prosperous consumer markets". McKinsey Quarterly, McKinsey & Company, July.

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

Piore M, and Sabel, C.F. (1984) The Second Industrial Divide: Possibilities for Prosperity, Basic Books, New York.

"Schumpeter" (2011), "Nipping at their heels", The Economist, 22 January.

Smith A (1776/1973), in Canaan (editor) An Inquiry into the Nature and Causes of the Wealth of Nations, The Modern Library, New York.

Wakabayashi D (2009) "Panasonic downsizes product design and price to fit emerging markets", The Australia/Wall Street Journal, 10 July.