|  |  |
| --- | --- |
| UNIT – VIII | **5 hours** |
| **SUPPLY CHAIN OF THE FUTURE**:  emerging mega-trends-shifting centres of economic activity, The multi-channel revolution seeking structural flexibility | |

In the relatively short time that companies have been focusing on managing supply chains, the world has changed dramatically. Over the last three decades or so since the phrase ‘supply chain management’ was first coined we have witnessed a **major trend to globalised supply chains,** with activities that were once performed in-house **now outsourced**, accompanied by a dramatic **increase in volatility in the business environment** creating ever higher levels of uncertainty in both demand and supply.

There can be little doubt that these changes are only the **precursor for the ever more seismic changes** that potentially lie ahead. Because the development of supply chain strategy has to be contingent on the conditions prevailing in the wider business environment, it is increasingly important that **supply chain managers understand what the future landscape may look like.** So often in the past, organisations have made decisions on their supply chain networks based on the world as it then was. Sometimes those decisions led to a loss of flexibility which inhibited the company’s ability to change quickly in response to changes in this business environment.

Whilst we cannot say with certainty what even the next few years will bring by way of change, there are some clear underlying trends which can provide some indication of the backdrop to the supply chain of the future.

**Emerging mega-trends**

Of the many emerging trends that will affect the shape of supply chains in the future, perhaps the most critical are those to do with demographics and changes in global spending patterns.

Some of these **demographic and wealth redistribution changes include:**

* A projected increase **in the world’s population from somewhere in the region of 7.7 billion in 2021 to over 9.7 billion by 2050.** At the same time **age profiles are changing differentially across countries and regions** and this combined with **cross-border migration** means that some countries’ populations will grow whilst others will shrink. As a result, **spending patterns are likely to change**, causing some markets to expand and others to decline.
* The United Nations reports that already today **half of the world’s population currently live in urban areas** and by 2050 about 70 per cent will be city dwellers. The growth in the number of ‘mega-cities’ – defined as having a population of over 10 million people – will continue as the move from rural to urban areas accelerates. The challenge of serving these massive conurbations will require an increased focus on ‘city logistics’ with city- specific supply chain solutions.
* **The trends towards a redistribution of wealth from the western world to the newly emerging economies will continue**. For example, it is estimated that over the next 20 years the US’s share of worldwide wealth will slip from 28 per cent to 24 per cent and that during the same time, Asia’s share of the global market will almost double – meaning that it will account for over 50 per cent of the global economy by 2030. The middle classes in the emerging economies are likely to increase from 400 million in 2010 to over 1 billion by 2030.

**The combined impact of these demographic and wealth distribution changes may well make existing supply chain arrangements less than optimal.** Businesses that have established production and supply arrangements designed to serve the **‘western-centric’** demand patterns that prevailed in the past may need to substantially reconfigure their supply chain networks to take advantage of the rapidly developing markets of Brazil and India, for example. To illustrate the dramatic changes in global spending power already apparent, it is estimated that Asia accounts for around one third of worldwide retail sales, including 35 per cent of all car sales and 43 per cent of all mobile phones. In addition, the geographical location of supply of many commodities could change as traditional sources may no longer be viable. For example, it is quite possible that because of climate change the patterns of global food production will alter quite dramatically. In other cases the relative costs of extracting and producing raw materials and basic commodities could change radically between countries, making some traditional sources uneconomic.

**Shifting centres of gravity**

All supply chains have a **‘centre of gravity’** determined by the pull of demand and supply factors. The relative costs and availability of materials and the costs of moving them to the point of final demand will determine where the optimal locations for factories, distribution centres and other value-adding activities should be.

**Because of the uncertainties that surround the future patterns** of demand and supply and the potential changes in input costs such as energy and other basic commodities, it becomes imperative that any decisions to redesign supply chains reflect the need to **maximise flexibility**. Ideally, the **supply chain of the future will be capable of adapting quickly** to any shifts that might occur on both the demand side and the supply side of the business.

Equally, with the continued volatility of many input costs, particularly oil and energy, many companies are already reviewing their existing supply chain strategies. For example, in June 2008, Keith Harrison, Chief Product Supply Officer of Procter & Gamble, was quoted as saying:

*Soaring energy costs are forcing P&G to re-think how to distribute its products … A lot of our supply chain work was implemented when oil was $10 a barrel … I could say that our supply chain design is now upside down … What is our business going to look like in 2015?*

**If the current conditions of turbulence and volatility continue then it may be that the supply chain solutions that served us well in the past may no longer be fit for purpose.** As we have highlighted above, there is mounting evidence that because of major demographic changes and redistribution of wealth across the globe, the ‘centre of gravity’ in many markets will shift – causing a rethink of existing supply chain structures.

The **shifting centres of gravity and the growing urbanisation of society are trends that are already evident** and forward-thinking supply chain planners will already be factoring them into their strategy. The **rise of mega-cities** presents a particular logistical challenge. These cities are bigger in terms of population than many entire countries and are often characterised by inadequate infrastructure. In developing economies such as India, the challenge of serving massive markets with a wider range of products to cater for a customer with greater discretionary spending power will require innovative logistics solutions.

The use of logistics ‘platforms’ located on the edge of large cities is likely to increase to enable the consolidation of shipments for delivery into those cities. This will be accompanied by a growing number of collaborative arrangements amongst companies that will share logistics assets such as transport and distribution centres.

**Whilst centralised production and offshore sourcing will still make sense for some product categories**, there will be a **need to bring supply much closer to demand**. This change in thinking will be driven by the growing environmental concern over carbon footprints but also by cost considerations as transport costs continue to rise. At some point in the future no doubt new forms of energy may become available which could reverse this trend – but that is likely to be some years away.

As well as these demographic and income distribution changes, **other trends are reshaping the supply chain landscap**e. One trend in particular is the emergence of new routes to market and the adoption by many companies of what has come to be termed ‘multi-channel’ distribution.

s

**The multi-channel revolution**

**Spurred on by the arrival of the Internet, there has been a dramatic growth in recent years of the use of alternative channels of distribution.** Whilst the old routes to market may still be used, they have been augmented by these new channels which more often than not bypass traditional intermediaries and **enable a direct contact** between the supplier and the customer/consumer.

**For example, many companies now offer their customers a range of options for ordering and for delivery/collection.** Thus a retailer might offer the traditional ‘bricks and mortar’ outlets but also an Internet service **for online shopping**, a telephone ordering option and the possibility of home delivery or collection from the store. The challenge for logistics management is to ensure firstly that the customer experience is consistent across all the channels and secondly that the channels can complement each other to enable, whenever possible, the most efficient use of resources, e.g. shared distribution centres and single inventories.

In consumer markets there is growing evidence that the Internet is **revolutionising both marketing and supply chain management.** Statistics from the UK suggest that, at the time of writing, **people under 25 are doing 40 per cent of their shopping online** whereas the **over 60s are doing less than 4 per cent** of their shopping online. Hence the likelihood is that with each passing year the total percentage of all transactions that take place through the Internet will grow dramatically.

It is not only the sheer scale of this new channel that brings challenges to logistics management, it is also the fact that the Internet is likely to speed up the shift from a sellers’ market to a buyer’s market. In a way, **the Internet ‘democratises’ the supply chain by placing the customer or consumer at the centre of the network**. The customer can rapidly access information on alternative suppliers, they can make price comparisons (as shown in the example from Japan in the box below), they can assess delivery lead times and they can demand to have their own specific requirements catered for.

**Equally the supplier can learn more about the customers and their buying behaviour** and can tailor marketing strategies accordingly. One of the best examples is provided by Amazon which has developed powerful tools to enable it to target existing customers with product suggestions that match the profile of their previous purchases. At the time suppliers can use the Internet to better manage demand by steering customers towards products that are currently available from stock or even towards ones that have higher margins.

**Associated with the rapid rise of Internet channels has been the growth of ‘mobile’ media,** i.e. the use of mobile phones to enable a two-way communication channel to be established, particularly between suppliers and consumers – alerting them of promotional offers, for example. Consumers increasingly are using new generation mobile phones for Internet access to place orders but also to make price comparisons whilst on shopping expeditions.

An example of how mobile media is affecting sales is given in the example below from Domino’s Pizza in Australia.

|  |
| --- |
| **iPhone app helps deliver more net orders for Domino’s**  Pizza chain Domino’s Pizza Enterprises says online orders have become a ‘significant’ part of business and account for **almost 30 per cent of sales in Australia.**  The company reported a 39.2 per cent increase in net profit for the six months to January 3 to $8.74 million, with same-store sales across the group rising 2.9 per cent. Same-store sales in Australia and New zealand rose 4.57 per cent.  Domino’s chief executive Don Meij said there had been a great response to the company’s iPhone application and customers were ordering pizzas online at ever- increasing levels.  Mr Meij said Domino’s iPhone application achieved more than $2m in sales and 200,000 downloads in its first 12 weeks, while online ordering accounted for 28 per cent of sales in Australia. ‘The digital platforms particularly have become significant to our business’, Mr Meij said.  ‘We will continue to invest in the digital platform as that is the future for pizza ordering well into the next decade.’  *Source*: ‘IPHONE APP HELPS DELIvEr MOrE NET OrDErS FOr DOMINOS’, *The*  *AuSTrAlIAn*, 18 FEBrUAry 2010  *[Same-store sales is a business term that refers to the difference in revenue generated by a retail chain's existing outlets over a certain period, compared to an identical period in the past, usually in the previous year. ]* |

**One of the advantages of having direct contact with the customer through online ordering is the dramatic improvement in visibility of real demand that it provides.** For example, Tesco, one of the world’s biggest online retailers (as well as one of the world’s biggest bricks and mortar retailers), can see what its real product availability is because it is able to capture actual demand as it happens and is therefore able to measure on-the-shelf availability accurately. In the bricks and mortar business, even with sophisticated **electronic point of sale (EPOS) data**, the company cannot get the same level of accurate information.

**From a logistics and supply chain management perspective, the multi-channel revolution has a number of implications.** Ideally all channels should be served by the same logistics infrastructure, e.g. sharing distribution assets such as distribution centres, vehicles and, in particular, inventories. If this can be achieved then significant benefits can be obtained through gaining incremental revenue greater than the additional cost.

Often multi-channel operations imply an increase in home delivery as many of these emerging channels are primarily aimed at end-users who require delivery to a specific address rather than collecting it themselves. Whereas a bricks and mortar retailer has the **‘last 50 metres challenge’,** i.e. how to manage the significant cost of getting the product from the delivery vehicle onto the shelf in the most cost-effective way, the online retailer is concerned with the **‘last mile’ costs.** Because most home deliveries are for a single case equivalent or less, the problem is how to ensure that the cost of delivery does not erode profitability. With the advent of agreed delivery times and the use of **dynamic vehicle routing and scheduling tools this problem should reduce.**

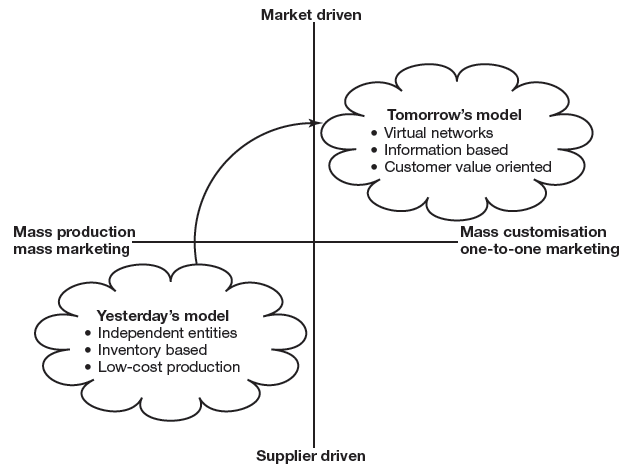
***The need for adaptability***

Clearly markets and supply chains are always in a constant state of dynamic change and adaption. **However, the evidence is that the rate of change has accelerated to the point where the business models that have served us well in the past may no longer work at all tomorrow**.

Figure 14.1 highlights this challenge. We have moved from a business environment where the supplier held the power – often through their ownership of resources, technology and brands – to a situation where the customer, or even the consumer, is now in the driving seat. **Where once it was a ‘seller’s market’, today it is a ‘buyer’s market’.** Simultaneously, the prevailing marketing philosophy has moved from the **idea** **of mass markets serviced by mass production to the idea of ‘markets-of-one’ serviced by mass customisation.**

Even though this fundamental shift has been observable for some time, it has not always been reflected in a similar shift in thinking about supply chain design.

The **traditional** supply chain business model was based around **maximising efficiencies,** particularly through the exploitation of the **‘economies of scale’**. So our factories were designed to produce things in large volumes and to maximise the use of capacity. This business model worked well in the conditions for which it was designed, e.g. the production of standard products designed for mass markets.



**Figure 1 The supply chain of the future**

The problem now is that the context has changed. We have seen a move from the lower left-hand quadrant in Figure 14.1 to the upper right-hand quadrant and yet many companies have not recognised the implications of this shift for supply chain design. What is now required are supply chains that are far more agile and better able to cope with rapid change and higher levels of variety and even customisation.

**Seeking structural flexibility**

**It has long been recognised that flexibility in operations and supply chain management is a desirable attribute.** Generally flexibility in this context has usually been defined in terms of the ability to respond rapidly to demand changes in volume or mix for existing products. **This capability might be defined as *dynamic flexibility***and it is linked to ideas such as set-up time reduction and the use of flexible manufacturing systems (FMS). However, in the world we have described earlier in this chapter, characterised by change which is discontinuous rather than incremental, a different type of flexibility is required.

**In effect what is needed is something we might term *structural flexibility***. Structural flexibility reflects the **ability of the supply chain to adapt or reconfigure its architecture in response to major changes** on the demand side or the supply side. Supply chains with high levels of structural flexibility are well able to cope with the levels of volatility that are a feature of the twenty-first century business environment.

Equally, when fundamental shifts in the supply chain’s centre of gravity occur they are capable of rapid adaptation to meet the changed condition.

**What are the key enablers of structural flexibility?**

Perhaps the most critical enabler, but the one most difficult to achieve, **is a corporate culture and ‘mindset’ that is open to change and is comfortable with frequent changes to processes and working practices.** Also, because some of the enablers of structural flexibility – discussed below – involve much higher levels of collaborative working across organisational boundaries, there needs to be a willingness to actively create ‘win-win’ partnerships across the supply chain.

Given that this co-operative approach to working across the extended enterprise can be achieved, the **main elements that underpin structural flexibility** include:

***Visibility and information sharing***

The ability to see from one end of the pipeline to another is essential. It is important to be able to see the changes that are on the horizon both upstream and downstream. Information sharing provides a powerful platform on which to build collaborative working relationships across the supply chain.

***Access to capacity***

An important facilitator of adaptive supply chain management is the facility to access additional capacity when required. **Capacity here refers not only to manufacturing but also in transport and warehousing.** Furthermore, that capacity may not be owned by the firm in question, it could come from partners across the network, third-party providers or even competitors.

***Access to knowledge and talent***

Given the rapid rate of change in both markets and technologies, a major challenge to organisations today is ensuring that they **have access to knowledge in terms of the potential for product and process innovation.** Equally critical is access to people who are capable of exploiting that knowledge. **‘Open innovation’** and **technology sharing agreements** are ideas that are rapidly gaining ground. Once again, companies are increasingly turning to external sources of knowledge and talent to provide adaptive capabilities.

***Inter-operability of processes and information systems***

In an ideal world organisations would be able to alter the architecture of their physical supply chains in short time frames with minimal cost or disruption involved. Equally, those same companies need the ability to manage multiple supply chains serving specific market segments. To **enable this reconfiguration it greatly helps if the nodes and links of the supply chain are ‘inter-operable’.** In other words they can be plugged together in a variety of ways to enable specific supply chain solutions to be easily constructed. Standard processes and information systems help greatly in creating inter-operability.

***network orchestration***

Because the achievement of higher levels of adaptability generally requires inputs from a variety of other entities in the wider supply/demand network, the need for co-ordination across the network arises. **As supply chains become more ‘virtual’ than ‘vertical’ there is a growing requirement for orchestration**. Whether that orchestration task is performed by the firm itself or by a specialist external logistics service provider or ‘4PL’, the ability to structure appropriate networks and to synchronise activities across the nodes and links of those networks is paramount.

Structural flexibility is increasingly a prerequisite for doing business in a volatile and turbulent environment. What can happen when that flexibility is lacking is well illus- trated by the example of the footwear fashion business Crocs (see box below).

|  |
| --- |
| **Crocs: riding the fashion rollercoaster**  Crocs is a North American based business that became famous for its iconic foot- wear that rapidly became a fashion item around the world. From its inception in 2002 until the end of 2007, the company experienced rapid growth and found it difficult to meet demand. In order to improve supply, Crocs significantly increased their production capacity, warehouse space and inventory. However, as sales peaked and declined, beginning in 2008, much of that additional capacity became redundant. The decline in sales continued as the global recession began to bite at the end of 2008 and into 2009. The company finished 2008 with a net loss of $185 million for the year. In quarter 1 of 2009 their revenues were down by 32 per cent compared to the previous year and the company reported a net loss of $22.4 million for the quarter.  Now Crocs was faced with excessive capacity with high fixed costs and was thus confronted with the need to consolidate their manufacturing and distribution operations. Starting in 2008 they shut down their Canadian and Brazilian manufacturing operations and abandoned specialist equipment and moulds that were used in the production of their unique product. As part of this process of retrenchment they consolidated their global distribution centres, cut their inventory by a half and reduced their global headcount by 2000. |