THE ROLE OF TIME COMPRESSION AND EMOTIONAL INTELLIGENCE IN AGILE SUPPLY CHAINS

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The concept of agile supply chains is attracting increasing research attention, and has been picked up with enthusiasm by commercial organisations, as a conference at Cranfield recently demonstrated (see below).

Agile supply chains have a number of distinguishing characteristics. They not only need to be network-based, but they also need to be market-sensitive, with highly integrated virtual and critical processes. Agile supply chains need to synchronise both supply and demand, if they are to respond in ever shorter time-frames to both volume and variety changes. The agile supply chain needs to be able to adjust output quickly to match market demand and switch rapidly from one variant to another.

Information technology is, of course, critical to the operation of agile supply chains, but this article will discuss two other key enablers of agility which have received less attention, but are nonetheless, critical to the success of such operations. These are time compression and emotional intelligence.

Time Compression

In his book *Business @ speed of thought* Bill Gates states that "If the 1980's were about quality and the 1990's about re-engineering, then the 2000's will be about velocity". To achieve velocity within organisations, time compression is required in all processes. Customers are increasingly taking low cost and higher quality for granted, and moving their attention to the availability of the product or service as soon as the need arises. This change in demand pattern has a knock-on effect right through the business environment, from the service/retail end of the value chain through to the supply chain, and on to new product development. This change in customer requirements is forcing businesses to become much more agile in adapting their products and processes to changing market demand.

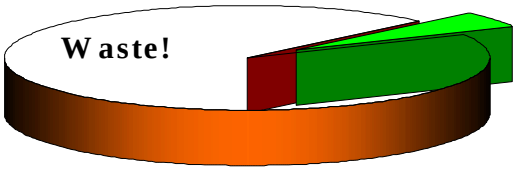
Leading edge companies have recognised that competitive advantage can only be gained by the application of time compression within the design and operation of supply chain processes. In order to survive, companies need to provide more value for less cost in less time, i.e. increase the proportion of "adding value" time in the total supply chain process.

The objective of a supply chain is to deliver value to a customer at a lower cost than the competition. Value is a mixture of tangible and intangible benefits, specific product features and also image, reputation and responsiveness. As the old marketing adage puts it: 'customers don't buy products they buy benefits'. The importance of time in the value perception of customers is becoming increasingly critical. The contribution of time in reducing costs can also be demonstrated. Thus time compression increases competitive advantage on both sides of the equation. i.e. by reducing costs and gaining competitive advantage.

Within businesses the need for improvement with respect to time-based resource management is receiving increasing recognition. Research indicates that it is not uncommon for the time spent actually 'adding value' within a manufacturing environment to be as little as 5% of the total process time, and in the context of the total supply chain, things can be even worse - as little as one tenth of 1% has been found to be 'adding value' time. In order to understand the contribution time compression can make to competitive position, it is important to be clear what it is not:

- Time compression is not work-study and human performance measurement based on historical observation, and the associated old ways of working to the old business process.
- Time compression is not about making people work faster, thereby risking quality, safety and their livelihoods.

Figure 1 – Within Typical Manufacturing Company Situations



Value Adding Time = 5%

Instead, time compression is about the removal of wasted time throughout the business, which generally results in improved customer satisfaction, reduction in inventory levels and increased quality (see Bearings case study). People are effectively working smarter not harder. Time compression complements existing change management, business process re-engineering or total quality type programmes. These are programmes which need to relate to issues that are very specific to a company's circumstances. The concept of 'time compression' complements and requires that these programmes exist and operate in a way that fully exploits the time-based approach.

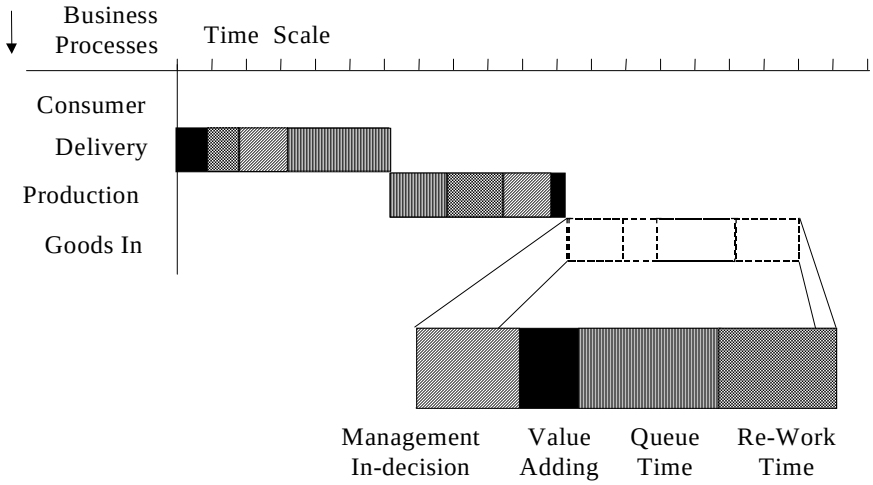
It has been found that by focusing on time in the supply chain the cost issues tend to look after themselves. Time is a common measure across all supply chain partners, whereas cost and transfer price data is open to a variety of interpretations. In comparison to activity-based costing techniques that are often used in the analyses of supply chains, focusing on time enables one to see 'the wood rather than the trees'. The analysis is also much faster and more effective - often using about 20% of the time and resources of a traditional cost based analysis. By focusing on time, analysis is forced down to a physical level. The time focus has proved to be easier to implement and yields rapid bottom line results.

Value-adding time is characterised using three criteria:

- Whether the process (or elements of the process) is physically changing the nature of the consumable item (i.e. the customer's product).
- Whether the change to the consumable item produces something that the customer values or cares about and may be willing to pay for.
- Whether the process is right first time, and will not have to be repeated in order to produce the desired result that is valued by the customer.

Non-value adding activity can be split into three categories: queuing time, rework time and time wasted due to management indecision. One does not need to be to concerned with the precise application of the definitions, because generally 95% of the time is wasted and therefore there is plenty of improvement to go for! A time-based process map can be used to visualise the value adding and non-value adding activities (see figure 2).

Figure 2 – TBPM value and non-value adding time



Bearing Partners - creating a virtual organisation to reduce inventory

Bearing Partners is an example of a 'virtual organisation' in that no physical assets or staffs are employed. The partnership is information-based and exists in order to improve the competitive position of all its members. It is also an example of the agility concept: co-operate to compete. In this example a number of sales companies, who were previously completely independent have recognised the commercial advantages of co-operation and are sharing certain types of operational data.

Bearing Partners is based in Germany and consists of a network of eight sales companies that market bearings manufactured by SKF, FAG and INA. The co-operative covers 26 locations serving the aftermarket with total sales of DM320 million.

The network has no staff members dedicated to Bearing Partners. The operation is managed by a steering committee whose major function has been to establish a virtual logistics centre. The centre's primary purpose is to facilitate data exchange between the eight partners and speed up order processing. All the partners share information about stock levels by part number, and undertake to focus on buying parts which will sell in the greatest volumes in their individual market territories. Rather than holding stocks of the entire product range at each location, high volume items are held close to that market, and low volume items are called up from other marketing territories where they are deemed to be high volume items.

The benefit of this virtual network of an organisation has been massive reductions of inventory. Price reductions have also been possible because Bearing Partners is purchasing in larger batch quantities from their suppliers. All the organisations are experiencing increased profits and the improved service levels achieved have created a barrier for competitor entry into their market territories. This example demonstrates the virtual and network based aspect of agility.

Deliverables of Time Compression in an Agile Environment

So what sort of deliverables can you expect from focusing on time? Specific achievements can include:

- Quality improvements of 60% to 80%.
- Productivity improvements of greater than 50%.
- Inventory reductions of 50% to 80%.
- Development time reduction of 50% to 75%

Surveys of companies involved in time compression projects have produced the following type of subsidiary benefits:

- Creating a time-based perspective of the entire business process.
- Validating and prioritising the opportunities for change.
- Achieving total process visibility through time based measures.
- Providing a foundation for a time-based organisation, aligned to business processes.
- Enabling agility within all systems, and improving customer satisfaction.

Also, in 50% of instances the above deliverables will be a catalyst for the following:

- Solution generation for the problems/opportunities identified.
- Identification of programmes for change.
- Identifying skills gaps in the organisation.
- Empowering people and generating enthusiasm for implementation.
- Immediate enhanced profits.

For example, after only three days data gathering and analysis of its European supply chain, one organisation was able to reduce a key lead-time from eight weeks to under three weeks. This yielded considerable decreases in inventory and improved customer service. The comment made by one of the senior logistics directors involved in the exercise was ‘‘the solution was simple once time was seen as important’’.

Focusing on time improves responsiveness and agility within organisations. One of the main benefits is improved visibility of the supply chain processes which enables improvements to take place. However, to undertake a successful time compression project in the supply chain the application of standard tools and techniques does not guarantee success. To gain access to information, and consequently manage change, soft skills are required and this leads to the need for emotional intelligence.

Emotional Intelligence

During Cranfield's research on agility one leading supermarket chain stated: "we do not want our store managers to be automatons, we want them to be entrepreneurs…." Entrepreneurs require a special set of skills that are not related directly to technical ability and intelligence.

The agile supply chain requires all organisations to have an emphasis on so called "soft skills". Technical ability and intelligence (IQ) alone do not guarantee success, and may only be one qualifying factor rather than the winning factor in the race to be agile. The emotional intelligence (EQ) of the organisation is critical in enabling agility. Daniel Goleman in his book *Working with Emotional Intelligence* discusses this factor in detail and our initial research highlights the requirements for these high level skills.

There are five critical areas of emotional intelligence (EQ) for an individual:

- **Self-awareness:** knowing one's internal states, preferences, resources and intuitions. This involves the ability to recognise one's emotions and their effects, knowing one's strengths and limitations and a strong sense of one's self worth and capabilities.

- **Self-regulation:** managing one's internal states, impulses and resources. This requires keeping disruptive impulses and emotions in check, maintaining standards of honesty and integrity, taking responsibility for personal performance, the ability to be flexible in handling change, and being comfortable with novel, innovative ideas, approaches and new information.

- **Motivation:** emotional tendencies that guide or facilitate reaching goals. This needs the skills of striving to improve or meet a standard of excellence, aligning with goals of the group or

organisation, readiness to act on opportunities and persistence in pursuing goals despite obstacles and setbacks.

- **Empathy:** awareness of others' feelings needs and concerns. This requires the ability to sense others' feelings and perspectives and taking an active interest in their concerns; the ability to sense others' development needs and coach their abilities; the skill of anticipating, recognising and meeting customer needs; the ability to cultivate opportunities through different kinds of people and the political awareness of reading a groups emotional currents and power relationships.

- **Social skills:** adeptness of inducing desirable responses in others. This requires influencing skills and effective tactics for persuasion, the ability to listen openly and send convincing messages; conflict management skills for negotiating and resolving disagreements; the ability to inspire and guide individuals and groups; the ability to initiate and manage change; working with others towards shared goals, and team capabilities of being able to create group synergy in pursuing collective goals.

Initial findings of research into agility confirm the need for the above skills. When building a network, social skills, empathy and motivation are of high value. The need to be 'virtual' requires workers to develop all five areas to maintain relationships vital for the workers' survival. Market sensitivity requires high levels of empathy with customers. Process integration requires all five areas to be developed - consider the political skills required for a 'supplier in-plant' at Bose! (see Bose case study).

A recent survey by the Society of Human Resource Management further emphasises the need for emotional intelligence in gaining competitive advantage. The survey analysed a series of top companies, selected for profitability, cycle times, volumes and other key performance measures. They found that the outstanding companies had the following competencies in managing their 'human assets':

- Organisational belief and commitment to basic strategy.
- Open communication and trust building with all internal and external stakeholders.

- An interest in building relationships inside and outside the organisation where they offered competitive advantage.
- Collaboration, support and the sharing of resources.
- An environment where innovation risk taking and learning together is promoted.
- A passion for competition and continual improvement.

These issues map easily onto the five emotional intelligence competencies described above, and are critical to the development of an agile supply chain.

An example of the importance of EQ compared with IQ was witnessed by one of my colleagues at Cranfield. She was called into a software consultancy organisation that was losing business dramatically to another organisation. There was little doubt that their products were technically superior, and the technical ability and IQ of the people was exceptional. However it was found that these technically brilliant people had very low EQ ability. This resulted in them having an inability to network effectively and build relationships with clients and suppliers. Consequently the organisation was under-performing. The good news is that individuals can develop EQ skills.

At a recent conference on agility at Cranfield the EQ issue was emphasised by a number of the speakers as a critical enabler for agility. Andy Richardson, the UK Supply Chain Director of Kraft Jacobs Suchard emphasised "To remain competitive (agile and responsive) KJS will continue to focus on the basics…getting the best people, integrating planning, enabling technology and minimising waste".

Graham Sweet, the manager of supply chain integration for Xerox Europe emphasises this EQ issue when discussing the agile supply chain by stating "It's all about relationships internal to your company and with external partners - this is all about people". Ian Grant, Director of the Virtual University at British Aerospace highlighted the need for an agile workforce with skills at a personal, team and organisation level. The key component of the agile workforce is flexibility to create and maintain long term business success.

Time compression at Bose through the use of 'supplier-in-plants'
The Bose Corporation, manufacturer of quality audio equipment, has taken partnership sourcing a step further. To manage supplier relationships to the level they required, Bose recognised more people were required within their organisation, but due to budget constraints no further people could be employed in this role. This acted as a driver to develop the JIT2 concept.

The just-in-time concept was seen to eliminate inventory and bring the customer and supplier closer together on an operational basis. The JIT2 approach eliminates the buyer and the salesman from the customer/supplier relationship, thus fostering increased communication between the parties. A supplier employee who resides full time in the customer's purchasing office replaces the buyer and supplier. This 'supplier-in-plant' is empowered to use the customers' purchase orders and place orders with their own company. The 'supplier-in-plant' also does the material planning for the materials supplied by his company.

The 'in-plant' is also part of the production planning process, so production is planned concurrently with the supplier organisation. This streamlines the supply process by removing the ''planner to buyer to salesman to supplier's plant'' process by making this the responsibility of one individual. This has dramatically reduced the uncertainty experienced by the supplier organisations. The benefits of this streamlining have also resulted in major business improvements for Bose. These include:

- 50% improvement relating to on time deliveries, damage and shortages.
- 6% reduction in material costs.
- 26% improvement in equipment utilisation.
- Major reductions in inventory holdings.

The Bose 'supplier-in-plant' concept demonstrates an aspect of process integration and also a technique for improving market sensitivity.

Conclusions

As the agile supply chain concept is developed and implemented in organisations, time compression and emotional intelligence are being seen as critical enablers. Information systems are of course a corner stone to any agile supply chain, but before these can be effectively implemented, visibility of the key processes needs to be achieved. This requires time compression techniques to be applied and high levels of emotional intelligence to be exhibited by those involved in the project.

There is little doubt that increased agility will be critical to all organisations in the future. In response to this, Cranfield School of Management is establishing an Agile Supply Chain Research Centre. The purpose of this centre is to identify the enablers and inhibitors to greater agility in the supply chain, to define the critical components of agile strategies, to create a working template for agility and to disseminate agile best practice across all industry sectors. We are currently seeking additional industrial partners for this research; contact us on 01234 751122 for further information.

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Dr Richard Wilding *works with leading European and international companies from a variety of industries on supply chain re-engineering projects. His Doctoral research applied chaos and complexity science to logistics systems and resulted in the development of new management guidelines for supply chain re-engineering. This innovative research received international media coverage including features on the BBC World Service and articles in the Times, Financial Times and New Scientist.*

Richard continues to undertake international lecturing and consultancy assignments in locations as diverse as Hong Kong, India, Poland and Italy. He has published widely in the area of logistics and is Editorial Advisor to a number of leading journals in the area.