

## BASIC CONCEPTS REGARDING SUPPLY CHAIN MANAGEMENT IN NETWORKED ENTERPRISES

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**Abstract:** Companies have increasingly focused on their own core business and created partnerships with other companies to increase their competitiveness. Linear supply chains of companies create the enterprise networks. The enterprise networks could produce wider product and service entities, and the entire network could be comprehended as a value adding value network for the product or service. The objective of this paper is to define the basic concepts in managing networked enterprises and supply chains, and how application integration can be achieved.

### 1. INTRODUCTION

A network consists of companies who share the same interests and act together to win in the markets. A network is always composed of individual companies who act in a network to succeed and survive in the business. Co-operation is usually voluntary. One of the most important goals of networking is effective adaptation to changing circumstances.

The strategic network is the core of the networked enterprises. A strategic network has one distinct core company that has a central role in the network. A central role means that the core company creates and develops the strategic network and also maintains it. After the strategic network are partner companies in the model of networked enterprises. Partner companies are co-operating with the companies in the strategic network.

The relationships between the strategic network companies and the partner companies are close and long term. The third level includes delivery contract companies needed in distribution and logistics, but these are outside the network.

### 2. BASIC CONCEPT OF NETWORK MANAGEMENT

The idea of virtual companies has been already presented [3,5] and the strategic enterprise network model includes this virtual company idea, as it is shown in fig.1.

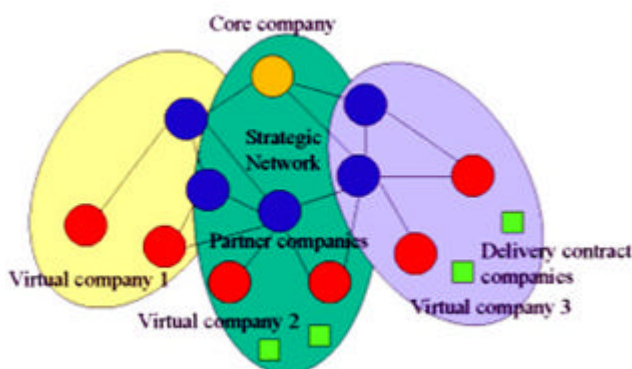
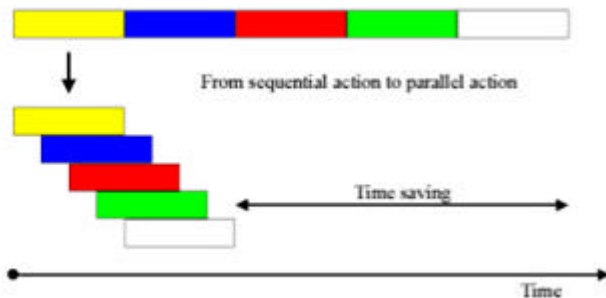


Fig.1. Model of strategic enterprise network

A virtual company is set up for concrete business tasks, for example, customer projects, delivery projects or product development projects. The consistence of a virtual company depends on the needs and it includes only the best possible know-how from each company. The idea is that together the companies could have special know-how they would not have individually. After the concrete business task, the virtual company is dissolved.

One of the reasons why it is reasonable for companies to create networks and get networked business partners is time saving. To survive in rapidly changing markets, organisations and their way of operation should change as the markets change. One solution in the fight against the increasing speed of business is to make things parallel. The idea is the same when comparing sequential and multiprogramming systems in a computer. Figure 2 shows the idea of time saving in a networked operation where different actions are made parallel [3].



**Fig.2. Making different actions parallel instead of sequential aims in time saving**

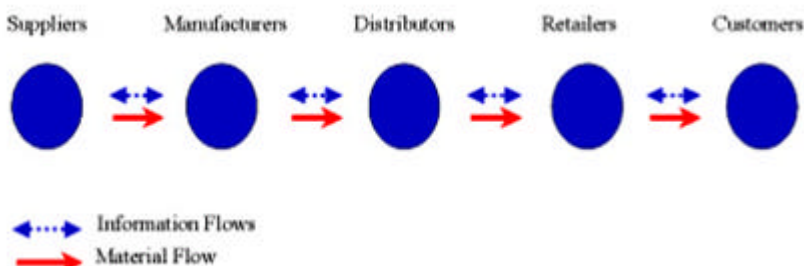
In serial action, all information is available for use when continuing to the next step. But in parallel action this is not the case. Therefore, a new challenge has emerged: to share information in real time when actions and processes advance.

### 3. SUPPLY CHAINS IN NETWORKED ENTERPRISES

There are several definitions for the supply chain. One says that the supply chain is the network of organisations that are involved in the different processes and activities that produce value in the form of products and services in the hands of the ultimate consumer [2]. The supply chain encompasses every effort involved in producing and delivering a final product, from the supplier's supplier to the customer's customer.

A supply chain is a system through which organisations deliver their products to the customers and it is a dynamic environment. The supply chains have become more complex in many industries, and the distance between the manufacturer and the end user has increased. More and more material is also moving between companies along the supply chain. Nowadays, it has become vitally important to act fast and to be more responsive. Short order cycle times are a prerequisite for competing successfully in the markets. Under such conditions, it has become important to get to know more about what the suppliers are capable of and what the customers want. To accomplish this, many companies try to improve visibility along the supply chain by using more advanced information technology. Visibility and transparency in the supply chain are very important aspects and so every player in the chain gets the same information at the same time. The supply chain participants are interested in important information: forecasts, product and production information, visions, market position information, and availability of material.

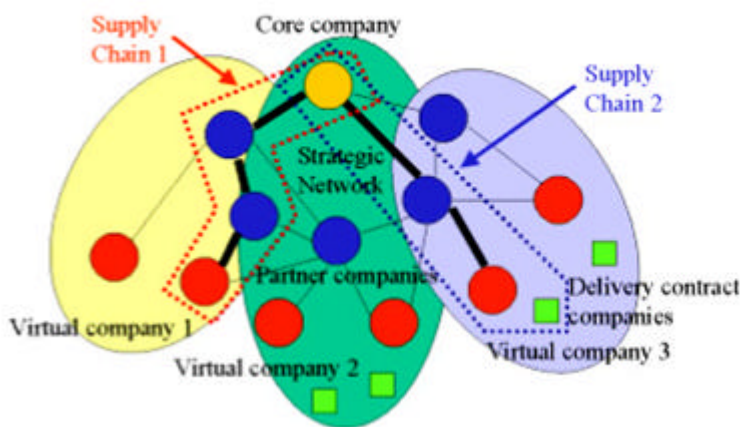
Figure 3 shows a traditional linear supply chain with suppliers and other



**Fig.3. Traditional supply chain**

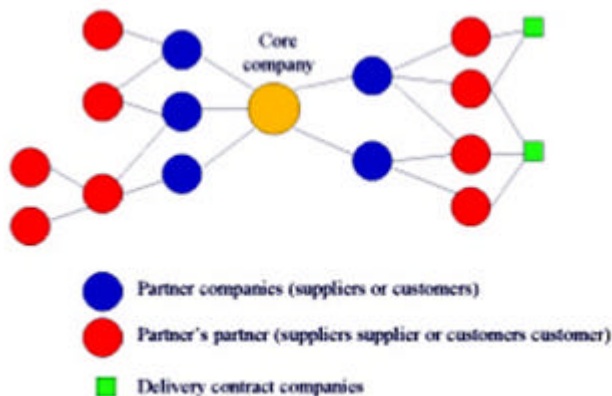
organisations, which produce products for the end users. Traditionally, the supply chain is a clear chain including the sequential players, the material flow and the information flows between them.

The traditional supply chain model is a simple model for demonstrating the idea of a supply chain, but in today's business this is not enough. The model of a strategic enterprise network gave a clear presentation of networked enterprises and it can be modified to show how the supply chains are located in



**Fig.4. Supply chains in strategic enterprise network**

include delivery contract companies as in fig. 4. It has been suggested that a supply chain could be defined as: "A network of connected and interdependent organisations mutually and co-operatively working together to control, manage and improve the flow of materials and information from suppliers to end users." [1,2]. In the model in fig. 5, there is no strategic enterprise network, so the partner companies do not work with each other, but they act with the core company. In that way the one supply chain consists of the core company, partner company, partner's partner and delivery company.



**Fig.5. Supply chain as a network**

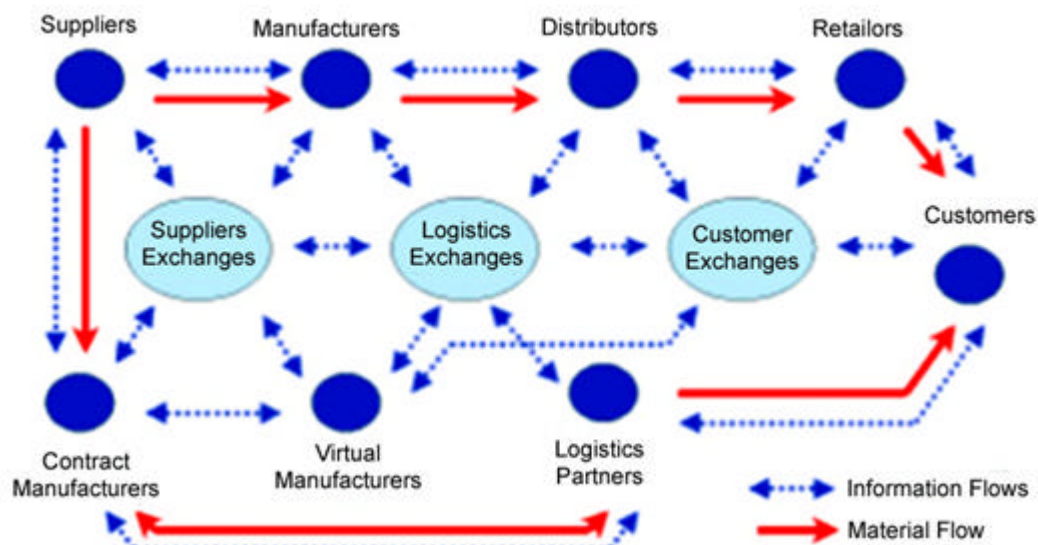
the enterprise network. Figure 4 shows an extended model of a strategic enterprise network with two supply chains.

Another point of view is to think that the core company is the centre of the network of suppliers and customers. Modifying the idea of supply chains in the strategic enterprise network, the core company can be showed as the centre of a network of organisations. That model can be extended to

The two presented models introduce the supply chain idea from two different angles depending on what kind of a network is around the core company and what kind of a strategic position the core company has in the network. The situation is also dependent on the core company's business strategy, does it need partners who act also with each other or just partners who act individually with the core company. The situation is usually case-specific.

Information technology is advancing at a phenomenal rate in terms of speed and storage capability with simultaneous dramatic reductions in cost and size. Figure 6 shows how the Internet is connected to the supply chain and the material flows between the supply chain players. The model is extended from the model presented in fig. 3 to include the Internet connections. As it can be seen, there are more information flows than material flows. That is the reason why information technology has got a key role in the supply chain. In fig.6, the information flows could be Internet connections or other ways of communication, but nowadays usually communication and information sharing happens via the Internet. Moreover, communication takes place usually in the supply chains using EDI (Electronic Data Interchange). EDI has been widely used over 20 years in business to business communication and information sharing.

The supply chain can provide immense competitive advantage to the company, if it is managed properly. There could be several Internet connections or other kind of information flows in the supply chain. Information flows are aspects that make the supply chains more competitive and stronger in business.



**Fig.6. Internet connected supply chain**

When a product offers better features or better quality than the competing product, the customer goes for the product even when the service is not good. But in today's business features and quality of the products are comparable and customer service acts as the positive value adder. Customer service includes issues such as delivery time, response time, ease of purchase, packaging, support, sales service, etc. The customer always compares these three criteria (features, quality and customer service) with the price of the product and if these benefits match or exceed the price, the purchase is made. Hence to make a sale, the company tries to maximise the value delivered by these three factors. When talking about well-managed supply chains, one could also talk about value chains or value networks. When the chain produces more than just the core product the customer could get more value from the product.

The extended product includes the following elements [3,4] :

- Technology enablers and solutions resulting from developments such as e-commerce, e-business or more general multi-mode business;
- A combination of a physical product and associated services/enhancements that improve marketability;
- Intelligent, highly customised, user-friendly tangible products including embedded features, such as maintenance;
- Intangible extended products that are information and knowledge intensive and can consist of services, engineering, software, etc.;
- Customer focus has shifted from the physical product to the associated value-added services.

It have been presented [1] that a successful supply chain relationship requires individual excellence, importance, interdependency, investment, information, integration, institutionalisation and integrity, and these rules are known as the eight Is that create a successful supply chain partnership. Bellow are presenting those eight's.

- ♦ Individual excellence - both partners are strong and have something of value to contribute to the relationship. Both are motivated and want to enter into a partnership;
- ♦ Importance - relationship is part of the partners' strategies and it plays a key role in the partners' long-term goals;
- ♦ Interdependence - the partners need each other and neither can accomplish alone what they can together;



♦ Investment - the partners invest in each other to demonstrate their respective stakes in the relationship and each other. The partners devote financial and other resources to the relationship;

♦ Information - the partners share openly information necessary for making the relationship work, including their objective and goals, technical data and knowledge of conflicts;

♦ Integration - the partners develop linkages and shared ways of operating so they can work together smoothly;

♦ Institutionalisation - the relationship gives a formal status, with clear responsibilities and decision processes;

♦ Integrity - the partners behave toward each other in honourable ways that justify and enhance mutual trust.

Then there might arise new questions, why the supply chains? In today's business, enterprises have founded or bought new manufacturing factories or have expanded geographically for other reasons. Multiple locations with different transport and storage facilities make control and monitoring much more difficult. By thinking all actions as processes and by using the idea of a supply chain makes the business effective and stronger. Supply chains are one solution for an organisation to survive and get stronger in business.

It is not enough to understand what supply chains are and how to create them, the enterprises should also manage them. Supply chain management is important to benefit from and use all potential of the supply chain.

#### 4. SOME PRINCIPLES OF SUPPLY CHAIN MANAGEMENT

Business globalisation, fast development of information technology and networking of the economy have affected the competitive and operational environment of companies. Companies have had to change strategies and activity models to survive in the markets.

Networking of companies has begun a new element in a new industrial activity mode. Creating networks is a big challenge because there are no models or methods for doing it yet. From a business point of view one of the biggest challenges is to give up old action methods and concentrate clearly on the core business action.

The supply chain managements can be divided in three parts [3]:

1. Supply - indicates a push
2. Chain - indicates individual, discrete links
3. Management - implies a static environment of control and measurement.

It is important to understand and define what a value chain means in the context of supply chain management. The value chain is a method of dividing a business into a number of linked activities, each of which may produce value for the customer.

The value chain idea helps in analysing processes that add value and eventually in bringing an organisation into an integrated supply chain. The value chain is a framework that enables analysis of the contribution of individual activities in a business to the overall level of customer value produced by the firm and ultimately to its financial performance. The value chain idea is that action in business is not just manufacturing or making services. The idea is that every player in the chain adds value and every player gets a part of that value. Also the value is transferred to the next player in the value chain and finally the end user or customer gets the value, not just the product. It has been presented that the management of upstream and downstream relationship with suppliers and customers means to deliver superior customer value at less cost to the supply chain as a whole [2].

The key players in supply chain management are:

- Material suppliers;
- Supply partners (wholesalers/distributors, retailers);
- Customers;
- Software product suppliers and system developers.

Supply chain management can be defined as the optimisation of the delivery of goods and services, and optimisation of information from the supplier to the customer. To the customer, the optimisation means that the supplier knows what the customer needs and understands the correct timing in the delivery of goods or services. To the supplier, the optimisation of delivery means that the right products or services are available in the right quantities at the right time. Market dynamics expand and intensify as a result of changing customer demands. Organisations that are in a position to adjust rapidly will survive.

The purpose of supply chain management is to increase throughput in the organisation while reducing investment and operating expenses by integrating internal and external operations of procurement, manufacturing and logistics into a synchronised process flow. It is mostly concentrated upon the sources of materials and products, vendor co-ordination and purchasing. Supply chain management is primarily concerned with managing enterprise integration with the suppliers, customers, transportation and information providers as it defines and drives the requirements for each.

Supply chain management ensures an efficient product flow and information in a timely and dependable way. An efficient information flow requires transparency in the chain. Linking the information systems together requires integration and synchronisation between the systems. Ultimate success in business depends on much more than managing the supply chains, but supply chain management is a very important aspect.

## 5. CONCLUSIONS

Suppliers, manufacturers, distributors, retailers and a host of service organisations have discovered that they must either transform their operations and tactics or be bowled over by competitors with more innovative and aggressive supply networks. By focusing companies could become strong and strategically attractive network partners. A company can back up the development of its own competitiveness with network partnerships, but its business cannot be based on that. Controlling and handling networks requires network management. The supply chain is the network of organisations that are involved in the different processes and activities that produce value in the form of products and services for the ultimate customer or consumer

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