國立中央大學工業管理研究所九十四學年度碩士在職進修專班入學考試試題卷

考試科目：工業管理實務
考試時間：90 分鐘



本試卷共有兩題，他們均需要您提出一些解決方法，請儘量發揮。**Good Luck!**

1. （50%）George 是一家成衣生產工廠的老闆，他的公司一直有個「無法於滿足交貨期的要求」的問題，George 發現導致此問題的原因有許多，從原物料、生產、到最後的包裝出貨皆有問題。您是一位生管專家，George 尋求您的幫忙，**請問您會如何幫他解決此問題？請說明。**註：（1）其他問題環境假設可自行增加，**但不能因此而偏離本問題的主題**，而且**務必**將假設列出，然後在您的問題環境下，提出解題方法。（2）請將所欲提出的方法之目的（或目標）加以說明。（3）也請將您將所欲提出的方法（或各種方法）之步驟，加以清楚說明，例如：您可繪製方法的流程圖，來幫助他人了解。

2. （50%）Henry 是一家大型超級市場的經營者，近幾年來同業的激烈競爭，讓 Henry 深深的覺得他必須改善其超級市場的經營。他聽到「豐田式生產系統（Toyota Production System）」在製造業非常流行，也有許多非常成功的例子。由友人那邊，Henry 也得知「豐田式生產系統」的相關管理哲學，其實也可應用在非製造業的領域。您是一位「豐田式生產系統」生管專家，Henry 尋求您的協助，**請問您會如何幫忙 Henry 實行「豐田式生產系統」於其超級市場呢？請說明。**註：（1）其他問題環境假設可自行增加，**但不能因此而偏離本問題的主題**，而且**務必**將假設列出，然後在您的問題環境下，提出解題方法。（2）請將所欲提出的方法之目的（或目標）加以說明。（3）也請將您將所欲提出的方法（或各種方法）之步驟，加以清楚說明，例如：您可繪製方法的流程圖，來幫助他人了解。

**Described below are two cases about the supply chain. Please make remarks for either one of the cases (針對個案之一評述) according to the "Value Chain Macro Process Framework" and "Spectrum of Customization Strategies" which are described in page 3.**

Sources of cases: Brehmer et al., TRILOG Europe Indicator Report, Department of Transportation and Logistics, Chalmers University of Technology, Sweden, 1999.

**Case 1.**

'One World' is a global supply chain actor both with regard to its sales through own cash and carry retail outlet in Europe and North America, and its supplier base in Europe (West and East), North America, Far East and China. 'One World' is responsible and controls a supply chain that besides the own organisation's functions (mainly purchasing, warehouses, retail outlet) includes suppliers and transport companies (Figure 1). To control and make the supply chain more effective has been a major goal during the last 5-6 years. Historically the belief has been that the downstream supply chain requires different performance indicators than the retail outlets.

As for many other similar companies the main focus is on sales in the retail outlet, since with customer in focus the company can secure big volumes. Through placing the supplier in focus "One World" can also secure the low price. From a supply chain perspective linking the customer and the supplier enables the actors to focus on the costs of providing the products to the retail outlet and making them available.

Based on the objective to improve the supply chain an internal project were set up which identified several performance indicators from which three major ones where identified:

- Availability in retail outlet
- The costs of providing the products to the retail outlet
- Customer returns

Availability in retail outlet is the *main service performance indicator* that 'One World' feeds back both into the logistics (warehouses, distribution centres) and to the purchasing organisations. To key suppliers (less than 25 of the total 1500) the availability in retail outlet are also feed back. Even if the supplier may not be responsible for all stages of the supply chain from the production the knowledge creates an incentive to work together with 'One World' to reach 100% availability in the retail outlet.

Costs of providing the products to the retail outlet is the *main cost related performance indicator* that is divided into different parts before it is feed back in the supply chain. Here the importance is placed on the development of the performance indicator. The main interest is regarding the on-going purchase cost (the actual cost for purchase administrative work related to an order), the distribution mode cost (the duration from the standardised distribution set up for each supplier), and the currency effect (a factor that trace the difference between sales and purchase currency). The cost indicator is handled only within the 'One World' organisation with exceptions that the on-going purchase cost is discussed with the supplier on different occasions.

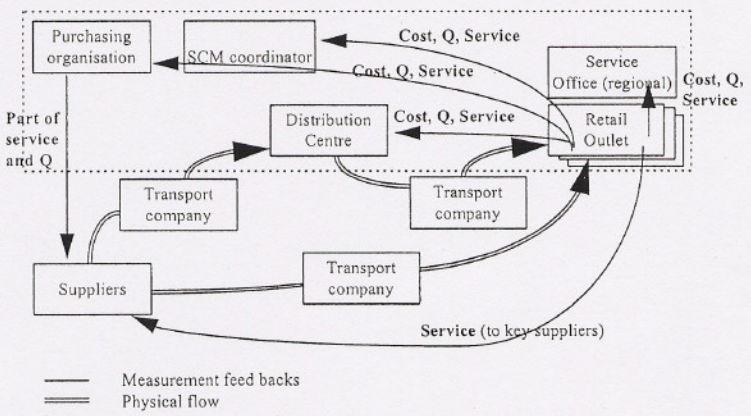


**Figure 1 Organisation of 'One World'**

Customer return is a *quality performance indicator* based on four different types of quality errors: wrong purchasing by the customer, product damage, handling damage, and sales error. This information is not feed back to the suppliers but the indicator is an important factor for different sectors of the 'One World' organisation.

**Case 2.**

"Electro.com" is a global actor in the computer and communication industry and the responsible partner in a network of organisations, which together evolves several supply chains. Each supply chain involves research, innovation, product design, production, logistics, sales and after sales activities. "Electro.com" is mainly responsible for research, product innovations and design, and sales activities whereas other actors are responsible for the rest of the activities. The supply chain is to a large extent based upon sourcing of components from Far East to production units in Europe, North and South America, and the Far East, and to global sales.

With a continuous introduction of new products 'Electro.com' is relying on a flexible supply chain which possess the possibility to easily ramp-up and introduce new products as well as phase-out old ones in the entire supply chain. During the last 5-year period an increasing part of the production capacity have been outsourced. To provide the customer within a short and predictable lead-time has been the major focus for the supply chain activities. Here it is important to remember that 'Electro.com' view is that the distribution and transport activities seldom set the lead-time limitations. Instead the lead-time is determined by the production and assembly flexibility in terms of their ability to handle volume and variants.

Parallel to other activities implemented in order to increase the supply chains efficiency an extensive work regarding performance indicators has been conducted. The focus is mainly on aspects that influence TTM (time to market) and TTC (time to customer) and the following performance indicators are used for the supply chain:

- time to customer (TTC)
- off-time delivery
- inventory turn over (ITO)
- costs
- time to market (TTM)

*Time to customer (TTC)* is specified for each product and involves a production time, a distribution time and an order cycle time. For each product these times are set and each are measured in the steady search for shorter but especially more reliable TTC. Reliable and predictable TTC are a necessity in this industry. TTC is only fed back to the final production/assembly stage. In the previous stages all production is done based on sales forecast and "Electro.com" view TTC as less meaningful for these actors. By focusing on TTC "Electro.com" will reach customer satisfaction, minimised inventories, and reduce the operational costs associated with reaching the customer with the right product. Therefor customer satisfaction is not measured on a regular basis but this is an important aspect of the sales activities to monitor. TTC is measured on a weekly basis.

*Off-time delivery* is besides TTC the most used performance indicator in 'Electro.com' and covers the same part of the supply chain as TTC. This indicator replaced on-time delivery in early 1999 since the latter lead to that actors were satisfied with a value of 96%, even if 'Electro.com' had the goal of reaching a higher on-time delivery performance. After the change the performance have increased since it have been easier to motivate the personnel to take action.

*Inventory turnover (ITO)* is a measure that is used in all stages in the supply chain since it is a performance indicator that is easily communicated. The experience is that a focus on ITO will lead to positive effects on lead-time to customer, production time, batch sizes (in production as well as transport) and many other areas. ITO is the main performance indicator used at central strategic level of 'Electro.com'.

Even if the pace of product introduction mainly determines the competitiveness costs are an essential factor for 'Electro.com'. The supply chain cost is the fourth performance indicator and the indicator is measured on a regular basis and reported weekly. The supply chain cost is given by the total of the transport, production, sourcing, administrative, inventory handling and carrying, and delivery to customer costs. For the supply chain the performance of each cost is not of interest it is rather the total sum and how the mixture of costs changes between different markets and similar products.

*Time to market (TTM)* is a measure of the entire supply chain and involves the time it takes to introduce a new innovative product on the market. This indicator does not involve the research work since it is measured in number of innovations and their impact on the competitiveness of the products (how much the capacity or production cost will change due to the introduction of a new product). TTM is measured on an irregular basis.

A *Value Chain* is the integrated macro processes of *Marketing*, *Design*, *Supply*, and *Customer* and comprised of four dimensions including *Strategy*, *Product Flow*, *Work Flow*, and *Information Flow*. A company must align all four dimensions in an improvement effort. Figure 2 puts the four frameworks together in high level process relationship map.

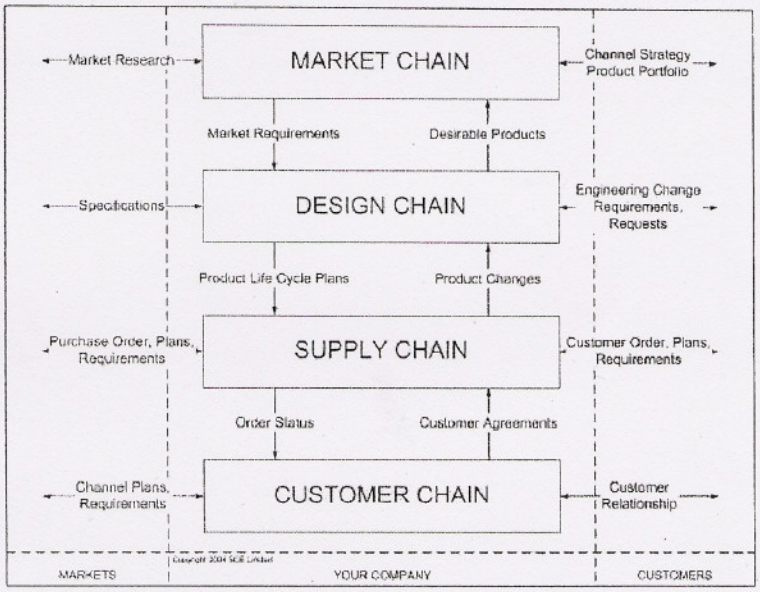


Figure 2. Value Chain Macro Process Framework

There are four customization strategies (Figure 3). In the first strategy, completely standardized products are offered. Customization is not achieved through varying product features, but through customizing the service associated with the product. The second strategy also revolves around standard products, which are configured, adjusted or altered to customer specifications. Configurable or adjustable products can be a direct substitute for mass customization. By designing products that can easily be adjusted to ft multiple sizes, tastes or functions, consumers can customize products on their own. In addition to adding more flexibility to customers, it is also often more economical for OEMs to design adjustable products than to mass customize them. The third strategy achieves customization through custom-assembly of standardized components. The crucial enabler of assemble-to-order production is the interchangeability of components through standard interfaces, or 'modularity'. In the fourth strategy, 'customized development', all components are developed and designed to customer specifications. The key difference to customized design is that the design will not be changed to accommodate standard parts, but will only use existing components if they fit into the framework laid out by the customer's specifications.

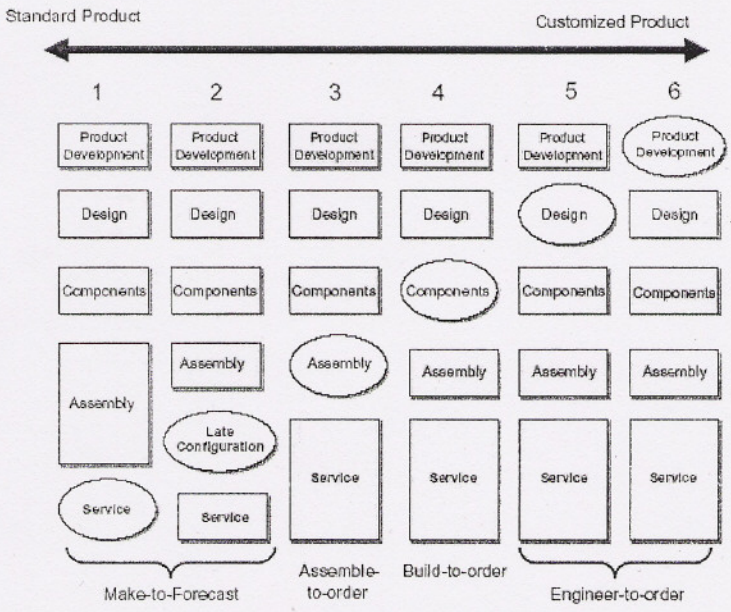


Figure 3. The Spectrum of Customization Strategies