



Chapter VI

Automotive Industry Information Systems: From Mass Production to Build-to-Order

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EXECUTIVE SUMMARY

Building cars to customer order has been the goal of volume vehicle manufacturers since the birth of mass production. Eliminating the vast stocks of unsold vehicles held in distribution parks around the world represents potential savings worth billions, yet the current supply chain resembles islands of control, driven by production push. Despite recent advances in information technology offering total visibility and real-time information flow, transforming an “old world” industry to adopt customer responsiveness and build-to-order represents a significant step change. This requires overcoming barriers both within and between supply partners and at all levels of the supply chain. Yet, what are these barriers really like and how can the industry overcome them?

ORGANISATIONAL BACKGROUND

Automotive manufacturing is a global industry producing 56 million new cars per year, and represents a significant proportion of gross domestic product in developed countries, for instance, 5% in the United Kingdom (Crain, 2002). Yet despite steady sales, the industry in Europe is facing a period of significant change, driven by poor profitability, excess finished stock and over-capacity. Current vehicle manufacturing and distribution represents an old-world industry struggling to come to terms with a digital economy, driven by increasingly price conscious, demanding customers who require vehicles built to individual specifications and delivered in short lead-times. Vehicle manufacturers can no longer rely on selling cars from existing stocks and are shifting their business models away from mass production toward mass customisation and build-to-order (BTO).

The 'double prize' for manufacturers in achieving BTO is eliminating the vast car parks of unsold inventory, and reducing vehicle discounting by dealerships that can demand a premium price for vehicles tailored and delivered according to customer choice. However, this increases the importance of existing systems for efficient order execution and integrated information flow, where manufacturers' IT infrastructure still reflects the hierarchical, function-orientated nature of communication in many corporations.

The rise of BTO reflects the increasing dissatisfaction in the marketplace with the traditional vehicle production philosophy that typically builds the vehicle first before finding a customer. In Europe, manufacturers expect dealers to hold between 60 to 100 days of inventory that amounts to billions of dollars (ATKearney, 2003). Even in the USA where vehicles are usually sold from dealer stock, 74% of customers would rather wait and order the vehicle instead of buying one from the dealer lot that is incorrectly equipped (*Business Wire*, 2001). Customers are beginning to realise that they are paying for the waste in the automotive distribution system. Hence, many manufacturers are now exploring the possibilities of reducing order-to-delivery lead-time to the customer through their own initiatives: that is, BMW — 'Customer Orientated Sales and Production Process'; Ford — 'Order Fulfilment'; Renault — 'Project Nouvelle Distribution'; and Volvo — 'Distribution 90'.

SETTING THE STAGE

The ability to communicate effectively both locally and globally increases the reliance on information systems (IS) and information technology (IT). The auto industry operates complex IS, where current systems act as a major inhibitor both to time compression in the order fulfilment process and to organisational change. These inhibitors or information barriers, are the subject of a research programme called '3DayCar'. A key finding from this research shows an average delivery lead-time of a new car in the UK is around 40 days. Moreover, only 5% of the delay is taken up by manufacturing, and 85% of the process is related to customer order, supplier schedule, and vehicle sequence information systems (Figure 1).

A transformation is required in order to satisfy customers and remove the functional chimneys, silo mentality and waste, towards the integration of IS across the whole supply chain. 3DayCar (3DC) is a complex project that aims to understand the current practice,

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