Chapter II

Challenging the Unpredictable: Changeable Order Management Systems

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ABSTRACT
This chapter deals with the changeability of order management systems (OMS). OMS are here referred to complex commercial off-the-shelf software (CCOTS) used, for example, for enterprise resource planning (ERP). Due to turbulent conditions in the business environment, a permanent need for change is the defining challenge for enterprises. However, far too often the rigidity of today’s CCOTS-OMS does not allow users to implement the intended changes in the business organization. In order to deal with this challenge, a cybernetic model of order management is presented in this chapter. Additionally, a decision oriented software engineering and architectural design for CCOTS-OMS is sketched. The authors are convinced that these approaches enhance the changeability of the development and operation of CCOTS-OMS as well as their co-operation with a business organization.
INTRODUCTION

The inevitability of rapid change in the competitive environment of business is a commonly agreed fact (Das & Elango, 1995; Tetenbaum, 1998). The changing business environment, coupled with maturing sales and procurement markets, results in enormous pressures on enterprises in their efforts to be competitive (Vollmann, Berry, & Whybark, 1993). Hence, companies have to operate their businesses under increasingly complex, turbulent, uncertain and unpredictable conditions. Significantly, the dynamic features of this turbulent environment are not just the outcome of the interactions between enterprises (Chakravarthy, 1998; Reinhart et. al., 1999; Schreyoegg, 1999). Furthermore, this turbulence is generated by the business environment itself (Emery & Trist, 1965).

To cope with these conditions, a permanent need for change will be the defining feature in the future business landscape (Bower, 1994; Milberg, 1997). However, especially small and medium-sized enterprises (SMEs) are challenged by the turbulence on sales and procurement markets. According to the European Council (1996), these enterprises can be characterized by less than 250 employees and 40 million • sales volume per year. SMEs commonly produce parts, subassemblies, products and/or service for large-scale manufacturers (Hauser, 2001). Hence, SMEs are located at the lower levels of their encompassing supply chain (see Figure 1).

A supply chain starts from the origin of the raw material and ends once the product has been consumed by a customer (Fredenall & Hill, 2000). The so-called “bullwhip effect,” which is presented in Figure 1 and typical for supply chains, may be one explanation for the turbulent, uncertain and unpredictable conditions often perceived by SME suppliers (Forrester, 1961). This effect comprises unexpected changes in demand patterns that continue to escalate further down the supply chain (Chopra & Meindl, 2000). Due to distortions of

Figure 1: An exemplified supply chain and the bullwhip effect

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