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Operational Development Potential in Project Oriented Manufacturing Industries in Finland

The competitive situation and economic success of three project oriented manufacturing industries in Finland is studied using operational efficiency measures. The industries studied are the manufacture of pulp and paper machines, the manufacture of steam boilers and the manufacture of electric motors and transformers.

Operational efficiency is defined as the ratio of value added to the costs of employing the necessary personnel and acquiring the necessary production machinery and equipment. The operational efficiency measures used are personnel efficiency, production investment efficiency and logistical speed.

The study indicates that operational efficiency is achieved through focusing on high value added and resource allocation. High operational efficiency is not driven by investment in machinery and equipment, but a result of operating practices. In the three industries studied increased operational efficiency is accompanied by improved operational speed. Additionally, in the manufacture of paper and pulp machines and the manufacture of steam boilers operational efficiency follows closely the changes in personnel efficiency. In the manufacture of electric motors and transformers a dramatic improvement in operational efficiency was enabled by access to world class international distribution channels.

The benefit of reduced lead times is much greater than the benefit of reduced working capital alone. A leadtime reduction has direct positive effects on efficiency. Faster throughput simplifies resource allocation and eliminates waste. In a supply chain delivering standard products speed improves transparency and gives supply chain members increased opportunities to adjust to demand variability. In a make to order environment speed is an indicator of effective project management. Time buffers between the different activities in the value chain is a sign of lacking confidence between the customer, the project coordinator and subcontractors.

In the project oriented make-to-order industry the potential for improved operational efficiency lies in changing operational and management practices. The methods and techniques developed under the headings of JIT, lean production and business process engineering are primarily based on experiences in the repetitive manufacturing environment. The application in the make-to-order industry requires particular adaptations and cooperation between organizational units.

Examples from project industry companies shows that a product oriented production system has significant advantages over the traditional process oriented mode of production. The communication and management of engineering changes is much simpler in a product oriented environment. In a product oriented production system it is possible to create direct links between product design and the shop floor. In a process oriented production system change management must be supported by traceability and product data management information systems.