

# Chapter XIV

## Integrated Manufacturing Applications and Management Decision Making: Putting the P Back into ERP

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### ABSTRACT

*The provision of timely, accurate, relevant, and concise information for managerial decision making has traditionally represented a challenge to information systems designers. The mass adoption of enterprise resource planning (ERP) systems has multiplied the amount of data being recorded about the movement of inventory in the supply chain. However, this online information requires much off-line manipulation in order for it to be meaningful to managers. In addition, these data are based on physical structures and business models that evolve over time, and thus inevitably a gap opens between the virtual enterprise and reality. Despite the benefits of inventory visibility and expenditure control afforded by ERP systems, managers still require data from other, nonintegrated systems. In this chapter the authors present their research on decision-making support in two manufacturing organisations, with the objective of understanding how these integrated applications support the manager in achieving his or her goals.*

### INTRODUCTION

**Enterprise resource planning (ERP)** systems have created a virtual infrastructure for the man-

agement of physical resources in manufacturing environments. In addition to their primary function of centralising business **transaction processing**, ERP systems provide a virtual audit trail of

the physical activities and movements that make up everyday production activity (e.g., consumption and replenishment of inventory, work order control, warehouse management, sales order allocation to finished goods, packing, and shipping). These highly integrated software packages have become a de facto standard for transaction processing in the modern manufacturing company, and indeed a basis for its interfaces with supply chain partners and customers.

In streamlining the transaction processing for production activity, ERP systems aim to reduce the potential for error in information handling as inventory is bought, transformed, and delivered to customers. By incorporating efficient data capture technology with powerful networking capacity, the vital transactional information is captured at source by users as an integral part of their work processes, and then made available instantaneously for management. This theoretical ideal makes the concept of ERP an enormously attractive one for large firms faced with on-going struggles to reduce costs and report detailed results to shareholders.

ERP systems are designed and implemented with efficient transaction processing, not management decision making, in mind. The time saved by the organisation in automating administrative processes does not necessarily imply faster decision processes. This is primarily because management decisions are generally based on the ability to compare actual data (often provided by the ERP system) with planned data (future performance scenarios in the form of targets). Also, quite simply, because the systems architecture and user interface that these diverging goals require are totally different. When selecting and implementing an ERP package, companies are looking at a good fit with operations, not with the more abstract decision processes. ERP vendor hype tends to build the perception among potential customers that if the transaction processing system works, managers will benefit from the increased visibility of operational data, independently of any

study of how they might exploit this abundance of information.

Management is also highly concerned with the efficient use of human resources, but the data model of ERP applications is inventory centric, rather than user centric. People are simply users from the application perspective, not resources with associated costs to be managed. For example, ERP systems are not designed to analyze the time taken by users to process a complete transaction (although transaction time and date stamping is an inherent part ERP). Neither are they designed to record the difficulty the user experiences attempting to reconcile a transaction screen with information related to a physical transaction that does not quite match the software template for data entry.

As with any system design, the implementation of a standard ERP package in a particular company, with its specific requirements, involves a certain number of assumptions about that company and how it operates. These assumptions may change over time due to the organisation changing what it does. Thus, even at go-live, there may be a gap between the physical processes of purchasing, manufacturing, and order fulfilment and their corresponding virtual processes in the ERP system.

This gap may manifest itself in an ever increasing requirement from managers for reports and queries to interpret the operational data. **Business intelligence (BI)** tools allow managers to interpret the underlying ERP source data in a more flexible manner, even to the extent of correcting idiosyncrasies in the source information with respect to the desired interpretation. The attribution of sales transactions to different regions or profit centers based on how the company wants to report its results is a case in point.

Relying on in-depth field work in two manufacturing organisations, this research aims to evaluate the significance of the gap between the reality of conducting business in a dynamic marketplace and the “hardwiring” of transactional

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