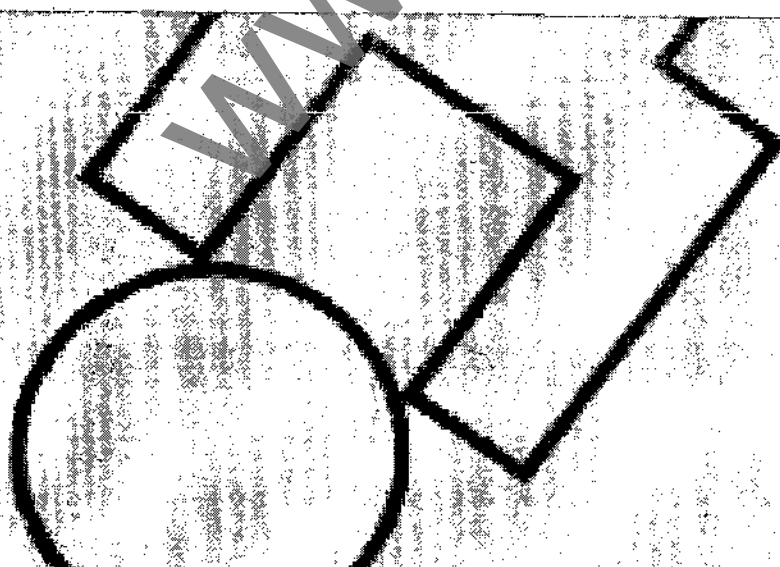


Franjo Cvetkja

Manufacturing Engineering Modular Series

Manufacturing Information & Data Systems

**Analysis, Design
& Practice**



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Manufacturing Information and Data Systems

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Dedication

To Ankica, Lidija and Marina
Thank you

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Preface

Today's manufacturing is more than ever governed by consumer demand forcing companies to adopt a flexible and efficient way of operating. Information technology has proven to be a very useful tool in accomplishing this task – so much so that it has rapidly permeated manufacturing organizations at every level. There is a growing need for those related to manufacturing and associated business to understand the nature of this technology and the way it can best be harnessed to provide information for manufacturing functions and hence to increase competitive advantage. This book aims to explain:

- the nature of manufacturing information and its importance for a company;
- generation, manipulation and use of manufacturing information;
- technologies that help in generation, manipulation and use of manufacturing information;
- strategic implication of information systems on manufacturing enterprises.

It is impossible to appreciate the way that information and concomitant information systems can aid the competitive advantage unless a basic understanding is obtained of the manufacturing information itself, and also of the information technology and human aspect related to its use. The level of understanding needs to be comprehensive to enable those in manufacturing to assess the importance and also the opportunities and limitations of modern information systems.

Chapter 1 introduces the concept of manufacturing information. After covering essential definitions of information, information technology and information systems, an overview of characteristics of manufacturing information is given and its classification explained.

Chapter 2 introduces database systems in general, and their application in manufacturing in particular. It begins with the database concept and by defining various database systems. The core of this chapter explains the design of relational databases and the process of design optimization – database normalization. Structured query language is also presented. The latter part of this chapter explains the application of relational databases in manufacturing and associated management issues.

Chapter 3 explains manufacturing resources planning systems that are commonly used today. It begins by explaining the material requirements planning concept, followed by extension to planning and finance issues. Implementation and management issues associated with manufacturing resources planning systems are also presented.

Chapter 4 focuses on shop-floor data collection systems as major generators of manufacturing information. It explains various technologies used for shop-floor data collection, their advantages and disadvantages. Human aspects related to shop-floor data collection systems are also covered.

Chapter 5 introduces the concept of telecommunications. The importance of telecommunications systems in their use for competitive advantage is also presented.

Chapter 6 explains the central ideas and concept of electronic commerce with focus on the use of the Internet.

Chapter 7 supplements previous chapters by explaining strategic implications of the use of information systems. Practical applications and consequences are at the heart of this chapter.

Glossary

1NF	the first normal form
2NF	the second normal form
3NF	the third normal form
4NF	the fourth normal form
ASCII	American Standard Code for Information Interchange
ATM	asynchronous transfer mode
AT&T	American Telephone and Telegraph
BCIM	Brunel integrated manufacture cell
BCNF	Boyce-Codd normal form
BOM	the bill of materials
bps	bits per second
CAD	computer-aided design
CAM	computer-aided manufacture
CCD	charge coupled device
CCMI	critical characteristic of manufacturing information
CCTV	charge coupled television (camera)
CIM	computer integrated manufacture
CMM	co-ordinate measurement machine
CODASYL	conference on data systems languages
CPU	central processing unit
CSF	critical success factors
DBMS	database management system
DBTG	database task group
DDBMS	distributed database management system
DDL	data definition language
DML	data manipulation language
EDI	electronic data interchange
EMI	electromagnetic immunity

EMC	electromagnetic compatibility
ERP	enterprise requirements planning
Gbs	gigabits per second
HTML	hypertext mark-up language
IMS	information management system
IS	information systems
ISDN	integrated services digital network
IT	information technology
JIT	just-in-time
Kbs	kilobits per second
LAN	local area network
Mbs	megabits per second
MIDS	manufacturing information and data systems
MIS	management information system
MRP	material requirements planning
MRP II	manufacturing resources planning
NCC	National Computing Centre
OCR	optical character recognition
OSI	operating systems interconnect
PBX	private branch exchange
PC	personal computer
PLC	programmable logic controller
RAM	random access memory
RS232C	serial link standard
SFDC	shop-floor data collection
SME	small and medium enterprise
SNA	systems network architecture
SQL	structured query language
TCP/IP	transmission control protocol/Internet protocol
URL	uniform resource locator
VAN	value added network
WAN	wide area network
WWW	the World Wide Web