SAP R/3 商业蓝图

——理解企业供应链管理

（第二版　影印版）

SAP R/3 BUSINESS BLUEPRINT

Understanding Enterprise Supply Chain Management

(Second Edition)

■ Thomas A. Curran
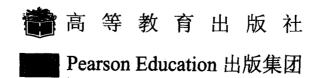
Andrew Ladd

SAP R/3 商业蓝图

——理解企业供应链管理

（第二版 影印版）

SAP R/3 BUSINESS BLUEPRINT

Understanding Enterprise Supply Chain Management

(Second Edition)

Thomas A. Curran
Andrew Ladd

图字：01-2002-6599 号

SAP R/3 Business Blueprint: Understanding Enterprise Supply Chain Management, Second Edition

Thomas A. Curran, Andrew Ladd

本书封面贴有 Pearson Education(培生教育出版集团)激光防伪标签，无标签者不得销售。

本书如有缺页、倒页、脱页等质量问题，请到所购图书销售部门联系调换。
版权所有　侵权必究

出 版 说 明

20 世纪末，以计算机和通信技术为代表的信息科学和技术对世界经济、科技、军事、教育和文化等产生了深刻影响。信息科学技术的迅速普及和应用，带动了世界范围信息产业的蓬勃发展，为许多国家带来了丰厚的回报。

进入 21 世纪，尤其随着我国加入 WTO，信息产业的国际竞争将更加激烈。我国信息产业虽然在 20 世纪末取得了迅猛发展，但与发达国家相比，甚至与印度、爱尔兰等国家相比，还有很大差距。国家信息化的发展速度和信息产业的国际竞争能力，最终都将取决于信息科学技术人才的质量和数量。引进国外信息科学和技术优秀教材，在有条件的学校推动开展英语授课或双语教学，是教育部为加快培养大批高质量的信息技术人才采取的一项重要举措。

为此，教育部要求由高等教育出版社首先开展信息科学和技术教材的引进试点工作。同时提出了两点要求，一是要高水平，二是要低价格。在高等教育出版社和信息科学技术引进教材专家组的努力下，经过比较短的时间，第一批由教育部高等教育司推荐的 20 多种引进教材已经陆续出版。这套教材出版后受到了广泛的好评，其中有不少是世界信息科学技术领域著名专家、教授的经典之作和反映信息科学技术最新进展的优秀作品，代表了目前世界信息科学技术教育的一流水平，而且价格也是最优惠的，与国内同类自编教材相当。这套教材基本覆盖了计算机科学与技术专业的课程体系，体现了权威性、系统性、先进性和经济性等特点。

目前，教育部正在全国 35 所高校推动示范性软件学院的建设，这也是加快培养信息科学技术人才的重要举措之一。为配合软件学院的教学工作，结合各软件学院的教学计划和课程设置，高等教育出版社近期聘请有关专家和软件学院的教师遴选推荐了一批相应的原版教学用书，正陆续组织出版，以方便各软件学院开展双语教学。

我们希望这些教学用书的引进出版，对于提高我国高等学校信息科学技术的教学水平，缩小与国际先进水平的差距，加快培养一大批具有国际竞争力的高质量信息技术人才，起到积极的推动作用。同时我们也欢迎广大教师和专家们对我们的教材引进工作提出宝贵的意见和建议。联系方式：hep.cs@263.net。

高等教育出版社
二○○二年九月

Foreword

Today's global business environments are characterized by unprecedented competitive pressures and sophisticated customers that demand speedy solutions. Understanding and optimizing business processes is a cornerstone of success in these fast-changing environments.

This book provides a basis for managers who desire an in-depth, hands-on understanding of business processes, explaining how to use them for the benefit of a corporation. SAP™ R/3™ Business Blueprint goes far beyond the well-known R/3™ system; it is a comprehensive reference for standard business-processes and has broad application for business, consulting, and academia.

Let me start with the value the book offers to business in general. There is a body of business knowledge and procedures embodied in business processes that every manager should know and comprehend in order to communicate problems, make judgments about efficiency and optimization, and assess the company's competitive advantage.

Moreover, in the '90s, with the emergence of powerful personal computers at home and the fabulous success of the Internet and electronic commerce, consumers are no longer waiting for business to lock them into any particular technology. They have turned the tables and now force business to rethink and adapt to their world. Consumers use the Internet to book flights, conduct banking transactions, purchase computer hardware, buy and trade financial instruments, and configure their own automobiles. Corporations cannot afford to sit and wait. They are forced to react to the technology demands, rethink their system infrastructures, and create better solutions. Software, systems, and business processes can certainly help in this respect, especially if they are based on a thorough understanding of what they are supposed to achieve.

Yet, business still deals with people. At the end of nearly every business transaction, people tend to be the primary decision makers in most situations. Thus, understanding how people function in an organization is also an important aspect of business-process knowledge. The business-process blueprint presented in this book not only describes how transactions take place but delivers a wealth of information about how parts of an organization and its people are involved.
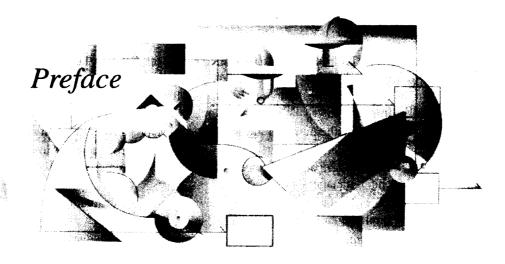
In my work with companies around the globe, I constantly run across difficulties because of a lack of understanding of how a business works in another country. The cultural nuances of doing business with peers in another culture consume much of the time managers need to make their businesses successful. Having a common understanding will increase the speed and inspire new confidence.

This book also offers specific benefits to consultants. Consultants are sometimes seen as the "high priests" of business-process management and business design. They develop process descriptions for corporations and benefit from a repetitive application of analysis principles. The faster they can present the basic business-process blueprint, the more time they will have to spend on the real issues that drive business success. Their focus will change from broad business descriptions to point processes that really matter to a company's livelihood.

Finally, in business education, one of the hardest—yet most essential—concepts that I need to communicate to my students is the idea of cross-functional integration. Our business education is structured around functional areas. Asked to describe how a procurement process takes place in a multinational firm, many students are at a loss due to the dearth of educational material available. This book will fill this gap by familiarizing tomorrow's managers with the practice of integrated business processes.

Equipped with the body of knowledge offered in this book, business decision makers, consultants, and students will be able to concentrate their work and study more effectively on areas that are strategic to running a company. When a firm understanding of business processes is in place, the real issues of business—those that provide value to customers, such as developing new products and brands and taking them to new markets—can be tackled more effectively.

Bernd Schmitt
Associate Professor of Business
Columbia Business School
Columbia University, New York

Preface

This book is intended for the wide range of business professionals who are interested in knowing more about process orientation in business and the implementation of these concepts in R/3™, SAP™'s client/server business application suite. It provides an inside look into the conceptual framework and strategy behind SAP™'s business engineering initiative. Most of all, the book explains the fundamentally different approaches to business change between the use of process model templates and the consulting method known as business-process reengineering, which promotes a zero-based business analysis and modeling.

Based upon our research and experiences, we have found that business professionals too often maintain an "at war" mentality toward their data processing departments and systems. Fed up with the jargon garden of technospeech and sick of the endless meetings needed to get everyone reading from the same page, business professionals, line managers, and system users crave a consolidated knowledge-based system that describes business processes in their own terms. This need was the spark that ignited the ideas in this book. Companies are paying millions to professional consultants to "implement" standard business processes, yet there is no common language on which to base their discussions or their process descriptions.

A guide to the business blueprint or reference model of the R/3™ system, this book is written for business executives, senior decision makers, business engineers, and members of R/3™ evaluation and/or implementation teams, along with students and academicians devoted to understanding business and information technology. We have attempted to make the book specific enough to satisfy the expert but general enough to provide a good overview for the capable newcomer. Our main objectives are to:

- Help senior decision makers understand the business benefits of the SAP™ R/3™ system
- Explain the methodology behind the Business Blueprint and its implications
- Examine the human and organizational requirements for change
- Provide detailed descriptions of key business process scenarios in the R/3™ system and their meaningfullness in e-commerce and supply chain management
- Describe the features and tools available for the evaluation and implementation of R/3™
- Document for the first time the deep process knowledge contained in the R/3™ system and use it as a benchmark for explaining business in general

For business leaders either currently or about to be involved in new business design, this book will explain SAP™'s Business Blueprint. To that end, we have labored to explain the R/3™ Reference Model clearly, keeping the big picture in mind, especially for those who do not want to get too bogged down in technical detail. Part 1, Business Engineering, examines the business theories behind the R/3™ Reference Model and its implications for optimizing business. Where possible, we draw on real business examples and interviews with some of the most successful R/3™ implementers around the world.

Part 2, Process Design, will be of special interest to business users working in the fields of sales, production, procurement, controlling, finance, human resources, and asset management. This section works through a number of organizational and functional scenarios and explains how the R/3™ system aids in the streamlining and structuring of key processes of different business areas. We cover primary value activities such as sales and distribution, production planning, procurement, and external accounting. We then move on to the supporting value activities, human resources management, business planning, finance, and controlling. Here and throughout, we draw from many real-life examples of how various companies have put R/3™ to use.

For the information technology staff member, programmer, or developer engaged in business design, Part 3, Architecture, Framework, and Tools, describes where R/3™ fits in the overall scheme of information technology and enterprise application systems. We first explore middleware transaction management and application distribution in R/3™. We then discuss the framework and infrastructure, focusing especially on the R/3™ Repository and Business Framework. Finally, we examine the R/3™ Business Engineer, SAP™'s latest platform for planning and configuring applications.
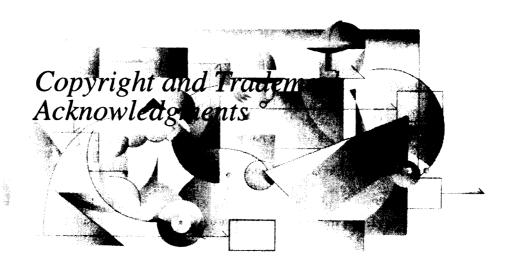
The last chapter documents the momentous change in application landscape that is being driven by business blueprints and the plethora of new technology alternatives ushered in with the advent of the Internet. We call this the Next Generation Enterprise, a future vision for how SAP™ and other ERP vendors will need to adapt their products in this new era. In the Next Generation, many common business practices and theories will change, but the most prominent will involve business-process thinking and the assembly and delivery of applications. This challenge will be a significant one for SAP™ and its counterparts in the enterprise software industry.

On the one hand, this book provides a comprehensive overview for those who are currently considering SAP™ as a solution for their business reengineering problems. On the other, for those who are already familiar with R/3™ and would like to know more, we offer a holistic approach to explaining how key parts of the R/3™ system are integrated. Ultimately, we hope to satisfy in part the growing need in the current business community to know more about business engineering with R/3™.

The customer quotations in this book stem from a comprehensive market research survey conducted by TCM, a management consulting company which is owned by Thomas Curran, lead author of this book. This work was the basis for SAP™'s positioning and product development in business engineering.

We gratefully acknowledge the kind assistance of SAP™ AG.

The authors would like to thank Peter Zencke for his understanding of Business Engineering and the concepts behind it; Hasso Plattner for his vision of Enterprise Software; Paul Wahl for his insights into market drivers and customer needs; all SAP™ development managers, especially Dennis Ladd, Stefan Meinhardt, Wolfgang Zuck, Carsten Dirks, and Kenichi Shimizu, who provided guidance on technical issues and future R/3™ development; industry analysts Barry Wilderman (Meta Group) and Erik Keller (formerly Gartner Group) for their insights into the future; Leslie Constans for her research, writing, and customer interviews; Hendrik Mager, Håkan Källberg, and Frank Wittmann for examples of technology architecture and framework discussions; Jill Wagner, Thomas Teufel, and Max Bezahler for their understanding of how the Business Blueprint is used in consulting and software sales; Peter Mullen (Visio Corp.), Piet Christiansen (IntelliCorp Inc.), and August Wilhelm Scheer (IDS Inc.) for their insights into third-party products development; and Heike Matz for all the graphics contained in this book. Special thanks go to Andrew Ladd for his patient support and professional writing. Without him this book would have never appeared. Lastly we thank the staff of our publisher, Prentice Hall, for their guidance and support along the way.

Copyright and Trademark Acknowledgments

Introduction

- "Business engineering is the rethinking of business processes to improve and accelerate the output of processes, materials or services." (Philip Morris, Lausanne, Switzerland)
- "It's the search for an optimal flow in a company." (Messerli AF, Switzerland)
- "It's the streamlining of business processes to have maximum effect with minimum resources in supporting company goals." (Ernst & Young, South Africa)
- "Generally, it's a customer focus. It's also the designing of new processes using new information technology to create an efficient business network that involves creative staff in the process redesign." (Fahrzeugausrustung Berlin GmbH, Germany)

Companies from around the world are taking advantage of information technology (IT) to radically alter how they conduct business. In the past, IT was used simply to automate existing business functions, but now IT can improve or completely change how businesses operate. This approach is called Business Engineering, which has been the logical next step in the business-process reengineering revolution.

Unlike business-process reengineering (BPR), which used IT mainly to automate certain functions performed in individual organizations—such as manufacturing, finance, or production—Business Engineering (BE) utilizes IT for designing or redesigning processes, the set of connected steps or "chains" performed in a business. In this way, BE takes advantage of information technology

to support the redesign of organizations. By using BE to engineer entire process chains that span functional or organizational boundaries, companies can integrate all their critical business activities. Moreover, they can do so much earlier in an IT implementation than if using the older, function-centric approach of early BPR strategies. Completing process chains rapidly and efficiently is of great added value to both the company and its customers. It makes such core processes as production and finance more efficient and can bring competitive advantages through reduced costs, faster time-to-market, and improved responsiveness to customers.

Business engineering arose out of the need created by BPR for software systems that could adequately support changing business processes. Although companies have gained a great deal from improving their business processes, many also have encountered problems with their business-process reengineering. After examining existing business processes, many companies completely dispensed with them, creating new process designs instead. Too often they miscalculated the risks and costs not only of reinventing new processes but of finding a software solution to match the new process design. After various trials and tribulations with poor software tools and systems, many companies have had to do away with their process design work simply because their information system software could not support the new design.

In Business Engineering, IT is used both to create and support new process designs. Software can describe, simulate, or model organizations. It can also show how changes made to the organizations will affect processes. BE is not limited to describing processes, however. A model or business-process diagram illustrates not only a company's tasks and organizational structure but also how the company gets things done. A company's information model usually includes descriptions of aspects such as data, function, organization, information, and communication flow. A well-integrated information system not only improves overall business operation but makes it easier for the company to identify areas for further improvement. With prefabricated models of business applications, companies can reduce their risks while taking advantage of best-business procedures for business process engineering.

As is the case in all engineering efforts, a good blueprint will map out the best strategies for implementing new designs. This book centers on a specific blueprint designed by the international software vendor SAP™, a company that has successfully integrated IT with business engineering. In support of its R/3™ system, SAP™ provides sample business objects and business processes that reflect the best-business practices in successful companies and that can either be used either "as is" or extended and customized by a company to suit its needs. These predefined processes are supplied in a comprehensive business blueprint called the R/3™ Reference Model, which is actively linked with the R/3™ running system.

SAP ™ R/3™ Business Blueprint: Understanding Enterprise Supply Chain Management is designed to function as a map of this system. Our aim is to guide the reader through the most important aspects of SAP ™'s Reference Model. All business professionals who are considering implementing or are currently using SAP™ software may benefit from this book. From the theory behind the applications to real-life business examples, this book guides the reader through the key areas of the R/3 ™ system. In order to help the reader better navigate through this book, the remainder of this Introduction will answer general questions about the book's subject matter as well as direct readers to places where more in-depth treatments of key terms and issues may be found.

I.1 WHAT IS SAP™?

Founded in 1972 in Walldorf, Germany, SAP ™ (Systems, Applications and Products in Data Processing) commands a significant share of the worldwide client/server enterprise application software market. SAP ™ is the number one vendor of standard business application software and is the fourth largest independent software supplier in the world. More than 10,000 companies in over 90 countries use SAP ™ software. Current SAP ™ company facts include:

- Leading client/server business software company
- Leading vendor of standard business application software
- Worldwide market share of 33%
- Fourth-largest independent software supplier in the world
- Availability in 14 languages
- 34% of customer base under $200 million
- 10 out of the top 10 U.S. companies with highest market value
- 8 of the top 10 largest U.S. corporations
- 8 of the top 10 highest profit U.S. companies
- More than 10,000 customers in over 90 countries

For a more detailed examination of SAP ™ and its history, see Chapter 1, SAP ™ and Client/Server Technology.

I.2 WHAT IS R/3™?

Initially, SAP ™ made the move from mainframes to open systems in the late 1980s with R/2 ™, a monolithic, mainframe legacy solution. As early as 1988, however, SAP ™ chose to move toward client/server technology and began devel-

oping R/3 ™. In 1992, SAP ™ unveiled R/3 ™ just as client/server and its potential were beginning to be fully realized in the business world. R/3 ™'s success is largely due to its ability to provide a highly integrated environment that can fully exploit the potential of client/server computing.

A full description of R/3 ™'s product architecture can be found in Part 3, Architecture, Framework, and Tools, but here we define R/3 ™ simply as SAP™'s enterprise application for open-system platforms. More specifically, R/3 ™ is an integrated enterprise software system that runs in open-system environments. The R/3 ™ architecture is essentially a three-tier client/server consisting of a database server, application server, and presentation server (see Chapter 1). These dedicated, task-oriented servers are linked in communication networks, which allow them to integrate data and processes within the system. The applications are developed using SAP ™'s fourth-generation language ABAP/4 and the ABAP/4 Development Workbench ª (see Chapter 15).

R/3 ™'s advantages lie in its flexibility, scalability, and expandability. R/3 ™ can be used in client/server architectures with 30 seats as in installations with 3,000 end users. This scalability ensures that R/3 ™ can provide support for current business operations and allows flexible adaptation to change and progress. Designed as a total system, but also suitable for modular use, R/3 ™ is expandable in stages, making it adaptable to the specific requirements of individual businesses. R/3 ™ can run on hardware platforms of leading international manufacturers and can integrate with customers' in-house applications. It is also open to allow interoperability with third-party solutions and services; it can be installed quickly and efficiently. R/3 ™ is so designed that such experts in scalable software as Microsoft, IBM, and Apple have all deployed SAP ™ as their enterprise solution.

In the age of Internet computing, SAP ™ R/3 ™ has emerged as a platform for electronic commerce, supply chain management, and data warehouse applications.

I.3   *WHAT IS THE R/3 ™ REFERENCE MODEL?*

SAP ™ has packaged 25 years of best-business practices in many different industries in the form of a "blueprint" called the R/3 ™ Reference Model. The Reference Model, also known as SAP™'s Business Blueprint, guides companies from the beginning phases of engineering, including evaluation and analysis, to the final stages of implementation. It is the definitive description of R/3 ™, providing a comprehensive view of all the processes and business solutions available in the system. Technical details, however, are "hidden" so that the business user can focus solely on business-process issues. Thus, the Business Blueprint is written in the language of the business user.

The Business Blueprint can be the starting point for business engineering efforts. Documenting processes in R/3™ is a critical part of the "understanding equation" at customer sites. To date, few companies have been able to provide a comprehensive, process-oriented description of a business that fits into almost any industry. The Business Blueprint is a means of streamlining processes and implementing R/3™ without a business having to start from scratch.

The Business Blueprint concentrates on four key areas necessary for understanding business: events, tasks or functions, organization, and communication. These areas define who must do what, when, and how. Events are the driving force behind a business process, prompting one or more activities to take place. This model is the essence of SAP™'s Event-Driven Process Chain (EPC) Methodology, which is discussed in Chapter 2.

In Releases 4.0, SAP™ offered more than 1,000 predefined business processes, with variants, that generally correspond to different industries and corporations—a milestone in the evolution of process management and enterprise software. These business processes are illustrated with the EPC graphical method. By connecting events and tasks, the method models and analyzes even very complex business processes. An EPC model can show where breaks in the chain of tasks and responsibilities hurt the ability of a company to optimize its processes. Graphical models help users select and understand the software, visualizing how data flow through business areas and showing how various functions interact with each other. The EPC model is the central, process-oriented view. Other models show function, process, information flow, and organization views.

The Business Blueprint can be viewed and analyzed with the help of the R/3™ Business Engineer, which is discussed in full in Chapter 16. A set of integrated tools for configuring R/3™, the Business Engineer has graphical browsing facilities for displaying the Business Blueprint directly from the R/3™ Repository, which contains all the data definitions and structures required by ABAP/4 programs. The Business Engineer also includes customizing components that allow a user to adapt or modify the system to meet the user's own specific needs.

Benefits of the R/3™ Reference Model during R/3™ implementation include quick overviews, business engineering support, and better communication among different departments (see Chapter 3 for implementation issues). A majority of R/3™ Reference Model customers use the blueprint for business-process modeling. Some organizations, however, use modeling tools and methods in different ways to suit their specific needs. In many organizations, process modeling is used for documentation, visualization of processes, better comprehension, training, and process optimization.

I.4 WHO USES R/3™?

R/3™ is the accepted standard in key industries such as software, oil, chemicals, consumer packaged goods, and high-tech electronics. Other industries include automotive, building and heavy construction, communication services, consulting (software), financial services, furniture, healthcare and hospitals, pharmaceuticals, public sector, raw materials, retail, services, steel, tourism, transportation, and utilities.

Table I-1 is a partial list of R/3™ users.

Table I-1   R/3™ Users

Industry	Company
Automotive	ITT Automotive Europe
	Yamaha
	Audi
	General Motors
	Chrysler
	BMW
	Subaru
	Toyota
	Volkswagen
Building and Heavy Construction	ABB Industrietechnik AG
	Gebauer
	Kawasaki Heavy Industries
	ADtranz ABB Daimler-Benz
	Babcock Prozess Automation GmbH
	CEGELEC AEG Anlagen und
	GESOBAU GAG
	Dover Elevator International, Inc.
	Dürkopp Adler AG
	E. Heitkamp GmbH
	Eldim B.V.
	Frequentis
Chemicals	Bayer
	Procter & Gamble
	CCPL
	Degussa
	Henkel
	Kemira
	Lever Europe
	Pirelli Pneumatici S.P.A
	Reichhold
	Sasol Alpha Olefins
	Schülke & Mayr