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运作管理 原理

第 **4** 版

Jay Heizer
Barry Render / 著

Principles
of Operations
Management

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运作管理
原理

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Jay Heizer / 著

*Jesse H. Jones Professor of Business Administration
Texas Lutheran University*

Barry Render / 著

*Charles Harwood Professor of Operations Management
Crummer Graduate School of Business
Rollins College*

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·院长寄语·

北京大学光华管理学院秉承北大悠久的人文传统、深邃的学术思想和深厚的文化底蕴,经过多年努力,目前已经站在中国经济发展与企业管理研究的前列,以向社会提供具有国际水准的管理教育为己任,并致力于帮助国有企业、混合所有制企业和民营企业实现经营管理的现代化,以适应经济全球化趋势。

光华 MBA 项目旨在为那些有才华的学员提供国际水准的管理教育,为工商界培养熟悉现代管理理念、原理和技巧的高级经营管理人才,使我们的 MBA 项目成为企业发展致富之源,为学员创造迅速成长和充分发挥优势的条件和机会。

为了适应现代人才需求模式和建立中国的一流商学院,北京大学光华管理学院正在推出国际 MBA“双语双学位”培养方案;同时,为了配合北大 MBA 教育工作的展开,光华管理学院与北大出版社联合推出本套《当代全美 MBA 经典教材书系(英文原版)》,并向国内各兄弟院校及工商界人士推荐本套丛书。相信我们这些尝试将会得到社会的支持。而社会对我们的支持,一定会使光华 MBA 项目越办越好,越办越有特色。

北京大学光华管理学院院长

陈以寿

出版者序言

2001年12月10日中国加入了世界贸易组织,从此,中国将进一步加大与世界各国的政治、经济、文化各方面的交流与合作,这一切都注定中国将在未来世界经济发展中书写重要的一笔。

然而,中国经济的发展正面临着前所未有的人才考验,在许多领域都面临着人才匮乏的现象,特别是了解国际贸易规则、能够适应国际竞争需要的国际管理人才,更是中国在未来国际竞争中所必需的人才。因此,制定和实施人才战略,培养并造就大批优秀人才,是我们在新一轮国际竞争中赢得主动的关键。

工商管理硕士(MBA),1910年首创于美国哈佛大学,随后MBA历经百年风雨不断完善,取得了令世人瞩目的成绩。如今,美国MBA教育已经为世界企业界所熟知,受到社会的广泛承认和高度评价。中国的MBA教育虽起步较晚,但在过去10年里,中国的MBA教育事业发展非常迅速,也取得了相当显著的成绩。现在国内已经有50多所高等院校可以授予MBA学位,为社会培养了3000多名MBA毕业生,并有在读学员2万多人。

目前,国内的MBA教育市场呈现一片繁荣景象,但繁荣的背后却隐藏着种种亟待解决的问题。其中很大一部分问题的成因是因为目前我国高校使用的教材内容陈旧,与国外名校的名牌教材差距较大,在教学内容、体系上也缺乏与一流大学的沟通。为适应经济全球化,国家教育管理部门曾要求各高校大力推广使用外语讲授公共课和专业课,特别是在我国加入WTO后急需的上百万人才中,对MBA人员的需求更是占1/3之多,所以,大力开展双语教学,适当引进和借鉴国外名牌大学的原版教材,是加快中国MBA教育步伐,使之走向国际化的一条捷径。

目前,国内市场上国外引进版教材也是新旧好坏参差不齐,这就需要读者进行仔细的甄别。对于国外原版教材的使用,在这里我们要提几点看法。国外每年出版的教材多达几万种,如果不了解国外的教材市场,不了解国外原版教材的品质就可能找不到真正适合教学和学习的好的教材。对于不太了解外版教材的国内读者来说,选择教材要把握以下几点,即:选择国外最新出版的书;选择名校、名作者的书;选择再版多次并且非常流行的书。综合以上几点来看,目前国内市场上真正出新、出好、出精的MBA教材还是不多的。

北京大学出版社推出的《当代全美MBA经典教材书系(英文原版)》弥补了国内MBA教材市场的缺憾,给国内MBA教材市场注入了一股新鲜的血液。全套丛书共由22本书组成,覆盖了北京大学MBA的全部主修课程,包括:经济学、管理学、营销学、战略管理、管理信息系统、运作管理、人力资源管理、商务沟通、国际金融、金融管理、决策分析、货币银行学、会计学等。另外在十几门主课的基础上又增加了几门高级选修课程,包括:国际会计学、组织行为学、投资学、商务学、财务报表解析、管理会计、管理沟通、商业伦理学、企业家精神等。

本套丛书的筛选大体上本着以上所提到的几点原则,即,(1)出“新”。克服以往教材知识陈旧、落后的弊端,大部分教材的出版年限都选择在2002年,与国外原版书同步出版。(2)出“好”。本套丛书收入了美国哈佛大学、斯坦福大学、麻省理工学院等著名院校所采用的教材,如:《管理学》、《营销管理》、《管理信息系统》、《管理人力资源》、《财务会计》、《管理会计》、《面向管理的数量分析》等;本套丛书收入著名学术界宗师包括斯蒂芬·罗宾斯(《管理学基础》)、菲利

普·科特勒(《营销管理架构》)、查尔斯·亨格瑞(《财务会计》)、威廉·鲍莫尔(《经济学:理论、方针和政策》)等人的学术巨著。(3)出“精”。大多数教材都是再版多次,经过不断的修改和完善而成的,如:再版5次的《卓越的商务沟通》、《现代投资理论》、《商业伦理:概念和案例》等;再版6次的《货币、银行和金融市场经济学》、《商务学》、《财务报表解析》等;再版7次的《面向管理的数量分析》等;再版8次的《经济学:理论、方针和政策》、《财务会计》、《管理信息系统》等;甚至还有再版12次的《金融管理与政策》、《管理会计》。本丛书中每一本书的选择都依据该书旧的版本,或作者过去同类书籍的销售情况,选择居于该领域销售排行榜首位的教材。

本套《当代全美 MBA 经典教材书系(英文原版)》集合了美国经济学界和管理学界各个学科领域专家的权威巨著,该丛书经过北京大学光华管理学院及其他著名高校的知名学者的精心选编,包括了大量精深的理论指导和丰富的教学案例,真正称得上是一套优中选精的丛书。

致谢

本套教材是我社与国外一流专业出版公司合作出版的,是从大量外版教材中选出的最优秀的一部分。在选书的过程中我们得到了很多专家学者的支持和帮助,可以说每一本书都经过处于教学一线的专家、学者们的精心审定,北京大学出版社英文影印版教材的顺利出版离不开他们的无私帮助,在此,我们将对审读并对本套图书提出过宝贵意见的老师们表示衷心的感谢,他们是:

北京大学光华管理学院:符国群、李东、梁钧平、陆正飞、王建国、王其文、杨岳全、于鸿君、张国
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本套丛书的顺利出版还得到了培生教育集团(Pearson Education)北京代表处、汤姆森学习集团(Thomson Learning)北京代表处的大力支持,对他们的付出我们也非常感谢。

教辅材料说明

教材,顾名思义教学之材料,它和普通的书籍有一个很大的区别,就是必须以“方便教授教学”为主。所以,好的教材更需有完备的教学辅助材料相匹配,且每一本教材都要有教辅材料,只有配备了齐全的辅助材料才能称其为完整的教材。北京大学出版社的《当代全美 MBA 经典教材书系(英文原版)》系我社获全球最大的教育出版集团,美国培生教育集团(Pearson Education Group)独家授权之英文影印版本。Pearson Education 旗下的国际知名教育图书出版公司 Prentice Hall/Addison Wesley/Longman,以其高品质的经济类出版物,已成为全美乃至全球高校采用率最高的教材,享誉全球教育界、工商界。我社在选择此套教材的过程中,尽量选择教辅材料齐全的教材,这些教辅材料包括:教学指导用书、教学提纲、测试题、解答题、课堂演示文稿等,以书、幻灯片(Powerpoint Mesentation)、Disk、CD、CD-ROM 等形式出现。我社特获权独家复制以上材料,并向采用该书的教师免费赠送。同时,这些材料还可通过访问培生教育集团相关站点:<http://www.prenhall.com>、<http://www.pearsoned.com>、<http://www.aw.com> 或国内站点:<http://www.digishop.com.cn> 免费下载。

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出版声明

本套丛书是对国外原版教材的直接影印,由于各个国家政治、经济、文化背景的不同,原作者所持观点还请广大读者在阅读过程中加以分析和鉴别。我们希望本套丛书的出版能够促进中外文化交流,加快国内经济管理专业教学的发展,为中国经济走向世界做出一份贡献。

我们欢迎所有关心中国 MBA 教育的专家学者对我们的工作进行指导,欢迎每一位读者给我们提出宝贵的意见和建议。

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内 容 简 介

《运作管理原理》第4版,分3个大的部分17章,为学生提供了技巧型的运作管理观点,向学生展示了运作管理的概述性理论。本书的目的就是展示运作理论基础,及其与有效的商品生产和服务之间的关联。

本版教材主要有以下特色:新增加两章,包括:运作管理、互联网和企业资源计划、电子商务与运作,向学生提供了企业对企业的电子商务案例,说明了这些主题的重要性;服务性个案研究;重新修改了课后习题,增加了近三分之一的内容,为学生提供最多、最有条理、最多样化的练习题;扩大了服务业的覆盖率,为学生提供的附加例子和新的案例讨论贯穿全书;新的专业站点,包括在线测试、案例学习、网上练习等内容。另外本书还有很强的国际特色,各章内容中都包括对一些国际问题的思考及对跨国公司案例的剖析。

适用性:适用于MBA、本科生和研究生运作管理类课程,还可作为各企业、公司管理人员的培训教材和参考用书。

畅销性:本书被包括宾夕法尼亚大学在内的欧美、澳、亚等地的几百所大学采用为教材,同时被翻译为多种文字以供各国人士参考学习。

作者简介

Jay Heizer 管理着得克萨斯州 Seguin 市得克萨斯州路德教会大学 Jesse H. Jones Chair 的工商管理系。他从北得克萨斯州大学获得 B. B. A. 和 M. B. A. 学位后,又在亚利桑那州立大学获得管理与统计学博士学位(1969)。他曾经在孟斐斯州立大学、俄克拉荷马大学、维吉尼亚联邦大学和 The University of Richmond 工作过。他还是波士顿大学、George Mason University 和捷克斯洛伐克管理中心的访问学者。

Heizer 博士有着丰富的实际工作经历。他在 Foringer and Company 作为一个机械学徒了解了运作管理的实际操作过程,他在 Westinghouse Airbrake 担任生产计划员,他还在 General Dynamics 从事过工程管理工作。另外,他还积极为很多组织包括:Philip Morris, Firestone, Dixie Container Corporation, Columbia Industries 和 Tenneco 提供 OM 和 MIS 方面的咨询。他还从美国生产和存货协会获得 CPIM 认证。

Heizer 教授和其他人合著过 5 本书,还至少发表过各种有关管理方面的文章 30 余篇。他的论文发表在《管理学会杂志》、《购买力杂志》、《人员心理杂志》、《生产和存货控制管理》、API-CS-The Performance Advantage、《管理史杂志》和《工程管理杂志》,及其他杂志上。他还给在校大学生、研究生和操作工讲授生产管理的课程。

Barry Render 是佛罗里达州 Winter Park 市的 Rollins 大学 Crummer 商务研究生院 Charles Harwood 的杰出运作管理学教授。他从辛辛那提大学获得运作研究理学硕士学位和定量分析学博士学位(1975)。他曾经在乔治·华盛顿大学、新奥尔良大学、波士顿大学和乔治·美森大学教学,在那他因为决策科学方面的成就获得 GM 专业基金,同时还任决策科学部的主席。Render 博士还曾经在通用电器、道格拉斯公司以及国际航空和太空总署从事宇宙航天业的工作。

Render 教授有九本合著教材被培科(Prentice-Hall)出版社出版,包括:《面向管理的数量分析》、《服务运作管理》、《管理学入门》和《管理学案例及解读》。他有涉及管理学各个方面的论文 100 多篇,分别发表于《决策科学》、《生产和运作管理》、《界面、信息和管理》、《管理信息系统杂志》、《社会经济学计划科学》和《运作管理评论》等刊物上。

Render 博士被授予 AACSB Fellow 的荣誉称号,1992 年和 1993 年分别被授予“最有前途学者”称号。他曾两次被选为决策科学协会东南地区副主席,从 1989 年到 1995 年他是 Decision Line 的软件评论编辑。从 1996 年起他还是《纽约时报》运作管理专栏的编辑。Render 教授还积极为政府代理部门和许多公司如:国际航空和太空总署、美国联邦调查局、美国海军、费尔费克斯县、维吉尼亚和 C&P Telephone 做咨询工作。

他在维吉尼亚的 Rollins 大学教授 MBA 的运作管理学课程,并任 MBA 项目主任。他所在的学派将 1995 年命名为 Render 年。1996 年他因为杰出的学术成就被 Roosevelt 大学授予 St. Claire Drake 奖。

To our families:

Kay, Donna, Kira, and Janée

Donna, Charlie, and Jesse

ABOUT THE AUTHORS



Jay Heizer holds the Jesse H. Jones Chair of Business Administration at Texas Lutheran University in Seguin, Texas. He received his B.B.A. and M.B.A. from the University of North Texas and his Ph.D. in Management and Statistics from Arizona State University (1969). He was previously a member of the faculty at Memphis State University, the University of Oklahoma, Virginia Commonwealth University, and the University of Richmond. He has also held visiting positions at Boston University, George Mason University, and the Czech Management Center.

Dr. Heizer's industrial experience is extensive. He learned the practical side of operations management as a machinist apprentice at Foringer and Company, production planner for Westinghouse Airbrake, and at General Dynamics, where he worked in engineering administration. Additionally, he has been actively involved in consulting in the OM and MIS areas for a variety of organizations including Philip Morris, Firestone, Dixie Container Corporation, Columbia Industries, and Tenneco. He holds the CPIM certification from the American Production and Inventory Control Society.

Professor Heizer has co-authored five books and has published over thirty articles on a variety of management topics. His papers have appeared in the *Academy of Management Journal*, *Journal of Purchasing*, *Personnel Psychology*, *Production & Inventory Control Management*, *APICS-The Performance Advantage*, *Journal of Management History*, and *Engineering Management*, among others. He has taught operations management courses in undergraduate, graduate, and executive programs.

Barry Render is the Charles Harwood Distinguished Professor of Operations Management at the Crummer Graduate School of Business at Rollins College, in Winter Park, Florida. He received his M.S. in Operations Research and his Ph.D. in Quantitative Analysis at the University of Cincinnati (1975). He previously taught at George Washington University, University of New Orleans, Boston University, and George Mason University, where he held the GM Foundation Professorship in Decision Sciences and was Chair of the Decision Science Department. Dr. Render has also worked in the aerospace industry for General Electric, McDonnell Douglas, and NASA.



Professor Render has co-authored nine textbooks with Prentice-Hall, including *Quantitative Analysis for Management*, *Service Operations Management*, *Introduction to Management Science*, and *Cases and Readings in Management Science*. His more than one hundred articles on a variety of management topics have appeared in *Decision Sciences*, *Production and Operations Management*, *Interfaces*, *Information and Management*, *Journal of Management Information Systems*, *Socio-Economic Planning Sciences*, and *Operations Management Review*, among others.

Dr. Render has also been honored as an AACSB Fellow and named as a Senior Fulbright Scholar in 1982 and again in 1993. He was twice vice-president of the Decision Science Institute Southeast Region and served as Software Review Editor for *Decision Line* from 1989 to 1995. He has also served as Editor of the *New York Times* Operations Management special issues since 1996. Finally, Professor Render has been actively involved in consulting for government agencies and for many corporations, including NASA, FBI, U.S. Navy, Fairfax County, Virginia, and C&P Telephone.

He teaches operations management courses in Rollins College's MBA and Executive MBA programs. In 1995 he was named as that school's Professor of the Year, and in 1996 was selected by Roosevelt University to receive the St. Claire Drake Award for Outstanding Scholarship.

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Foreword

FOREWORD TO THE FOURTH EDITION OF PRINCIPLES OF OPERATIONS MANAGEMENT

When I first entered a production operation in 1952 the world of business was divided into two parts, like the Red Sea had been. One part made big things out of little things; the other part purchased the little things, found the customers, took care of the money, sold stuff, and complained about the activities of the first part. The two portions of the company had nothing in common and little interest in each other.

Over the years it was discovered that there are no separate parts of an organization. It is a body that requires all components to function together as a unit if a successful life is to be obtained.

However everyone knew that the world was made up of separate parts. Markets were described as domestic and international. The latter was not part of the organization and often had a great deal of difficulty obtaining information about plans, products, and people. Now we have learned that we have suppliers and customers who do not speak our language or observe our holidays.

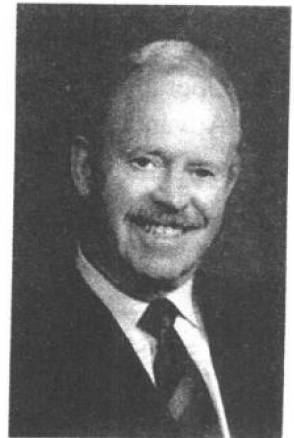
Functional operations used to be responsible for whatever noun was in their title. Manufacturing manufactured, purchasing purchased, personnel personneled, and quality was done by the quality department. When I was a quality manager top management held me personally responsible if a customer received something that was not proper. Everyone else were "bad guys" trying to get stuff by quality, and we were the "good guys." When enough things went wrong the practice was to find a tougher, smarter cop. There was no thought of getting things done right.

When I began preaching the prevention of problems, called quality management, it took a while for people to catch on. The breakthrough came with the determination of the "price of nonconformance." How much did it cost to do things wrong, and then fix them. Most companies came to the realization that it took 25% and more of their revenues to live that way. That was the beginning of the quality revolution.

When I talk to Professor Render's classes each year I am always impressed that the students are learning to look at the world from a platform that did not exist in my early career. The broad scope of this book assures that this will happen. It provides a place to begin the future by reviewing the past. The students always want to know about the "reality" of quality management, which is the general subject of my chat. I tell them that basic concepts are the important part of business management, that there are no "systems" to do the executive's work. Concepts come from understanding, understanding begins with learning, and learning comes from examining credible resources with an open mind.

I know you will enjoy yourself in this course.

PHILIP CROSBY
Winter Park, Fl.



Preface

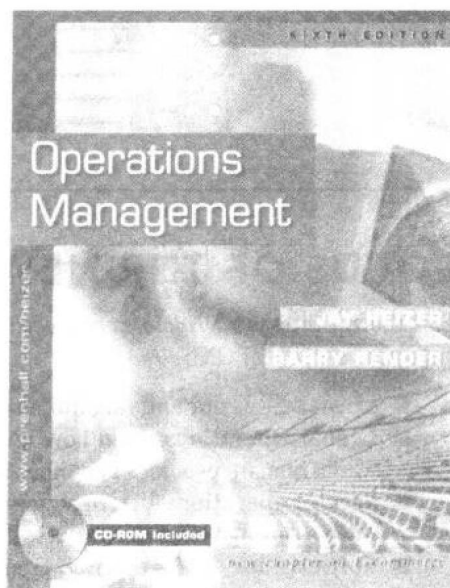
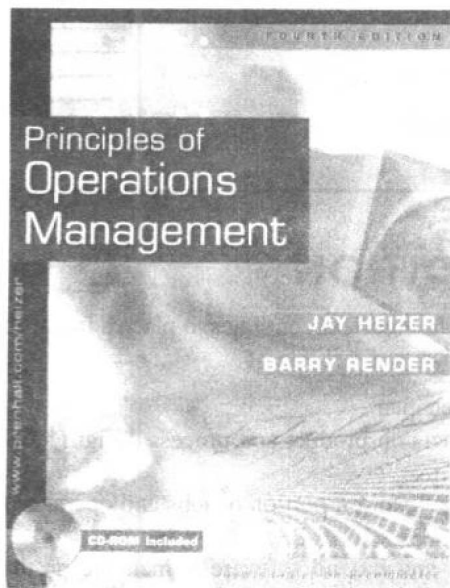
Welcome to *Operations Management*, Sixth Edition, written as a broad introduction to the field of operations management. In this book, we present a state-of-the-art view of the activities of the operations function. Operations is an exciting area of management that has a profound effect on manufacturing, services, and productivity. Indeed, few activities have as much impact on the quality of our lives. The goal of this text is to present the field of operations as realistic, practical activities that improve the quality of life.

Operations management includes a blend of topics from accounting, industrial engineering, management, management science, and statistics. Operations management jobs can be challenging, important, and rewarding, and can lead to successful careers. Even if you are not employed in the operations area, you will be working directly with people who are. This book can help you understand how OM functions and impacts society and your life. Certainly, you will better understand what goes on behind the scenes when you place an order through Amazon.com or buy a customized Dell computer over the Internet.

Although many of our readers are not OM majors, we think that the marketing, finance, accounting, and MIS students will find the material both interesting and useful. Over 250,000 readers of our earlier editions seem to have endorsed this premise.

TWO VERSIONS OF THE TEXT

This text is available to professors and students in two versions: *Operations Management*, Sixth Edition, which is hardbound, and *Principles of Operations Management*, Fourth Edition, a paperback. Both books include the identical core chapters 1–17. However, *Operations Management*, Sixth Edition, also includes six quantitative modules in Part IV.



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