

运作管理

管理学系列·英文版

运作管理

(第二版)

运作管理



OPERATIONS
MANAGEMENT
Focusing on Quality
and Competitiveness
(SECOND EDITION)

罗伯塔·S·拉塞尔 著
伯纳德·W·泰勒

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罗伯塔·S·拉塞尔 著
伯纳德·W·泰勒

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出版说明

管理是一个古老而现代的话题，说它古老，是指从人类开始分工协作进行生产和经济活动以来，管理就一直扮演着重要的角色。管理的发展与经济的发展是密不可分的。说它现代，是指自近代以来，随着各类组织的大量出现，使得管理已无处不在。特别是组织结构的日趋多样化和大型化，使管理的复杂性和重要性比以往任何时候都显得更加突出。造成这种复杂性的原因很多，其中最重要的因素是技术的变革，以及由这种变革带来的经济的迅速发展和全球一体化趋势。在当今外部环境剧烈变化的条件下，企业要面对激烈的市场竞争，就必须提高管理水平。也只有科学的管理，才能够创造出不同于其他企业的竞争力。大凡成功的企业，无不以其自身独特的哲学理念和企业文化而赢得市场，赢得未来。

经过 20 年的改革开放，中国的经济体制正在迅速与国际接轨，同时，企业的管理观念和管理水平较之计划经济时代，已经发生了巨大的变化。但是，我们不能否认，与发达国家相比，我国大多数企业的管理水平和我国的管理教育水平，仍有相当大的差距。因此，学习和借鉴国外先进、科学和有效的管理理论和方法，仍是我们现阶段的主要任务。为了让中国的管理者和广大管理教育界师生，能够及时了解和掌握国际上管理理论和方法的最新发展动态，中国人民大学出版社与享有盛誉的 Prentice Hall 出版公司合作，为中国读者精选并推出这套新近出版和再版的《管理学系列·英文版》，以期为我国各大学和管理学院师生及企业管理人员，提供优秀的管理学原版图书，为推动中国的管理科学事业发展，做出我们应有的贡献。

关于这套丛书的策划和选择，我们是基于以下的认识：面对以人和知识为主体的知识经济时代，我们重视“以人中心”的组织与管理；面对国际经济一体化的大趋势，我们强调不同文化背景下的管理应相互尊重和借鉴；在企业外部环境的剧变条件下，我们重视战略管理在企业经营中的作用；在企业内部的管理运作中，我们强调各层次和上下级之间的有效沟通。同时，我们所选择的这些英文版图书，也尽可能地兼顾了企业实际管理人员自学和管理院校教学两方面的需要。

本丛书的作者，皆为美国管理学界有影响的教授，其内容涵盖了管理学的各重要领域，反映了美国管理学界 90 年代以来的理论研究和实践探索水平，因而受到美国和世界各地读者的欢迎。有的版本已多次再版，畅销不衰。我们希望这套丛书的出版，能对

提高中国管理教育水平和企业管理水平产生积极的作用。

根据读者要求，我们在这套丛书出版时，组织专家学者将每本书的前言和目录译成中文，作为对原版的一种导读，同时仍保留了英文版中的前言和目录，供读者们阅读时参考。这样做虽然增加了不少工作量，但如果能为需要中文导读的读者们提供方便，我们便感到十分欣慰。

本丛书在论证和选择过程中，得到了中国人民大学工商管理学院徐二明院长、中国人民大学劳动人事学院孙健敏副教授、对外经济贸易大学国际工商管理学院张杰副院长，以及姜勇女士的大力支持和帮助。在此谨向他们一并致以敬意和衷心的感谢。

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前言

我们是基于以下的考虑来着手编写这本运作管理教科书的。首先，我们希望这本书思路清晰，论证精确，条理清楚，从而使广大学生认为有较强的可读性。我们也想通过插入大量“特写”和实例来增强书的趣味性。其次，我们力求使书中的概念顺理成章并且易于理解。我们希望最有效地使用语言，从而避免使用繁冗而拖沓的语言和大量数学推理来表达一个直截了当的意思。最重要的是，我们想激发广大学生学习运作管理的热情。今天的时代，是制造业与服务业运作中新奇变化层出不穷的时代，我们想以本书带动运作管理的学习热潮。

我们在本书的第一版中已基本包含了上述的想法，但编写这样一本书仍有很大的提高余地。因此，在这一版中，我们更加注重如何更好地实现我们的编写目的，如何在本书中注入更新的内容。

课文主题

我们力求使这本书有较强的时代感和综合性。在今天的运作管理领域中，发生了许多新的重大变化，我们希望将这些新的变化与较为传统的生产管理内容有机地结合起来。所以，我们在本书中把质量和竞争力作为重点，并在全书中贯穿了“战略”这一隐含在质量与竞争力当中的重要因素。我们并不认为质量管理仅是近年来生产管理领域刚刚兴起的一个潮流。事实上，质量管理是一种相当普遍的经营理念，它影响着管理领域中所有其他的方面，质量管理已成为企业参与全球市场部分的全面战略中一个极为重要的部分。对于许多企业来说，全面质量管理推动着其策略方案的出台。

运作管理人员在以下职能范围内为企业进行决策：产品与服务设计、内部设施布置与选点规划、企业计划与进度安排、供应链管理等。这些决策的基础是，在为达到企业目标的策略设计中，它们集合的有效程度有多大。本书中的章节是按照各部门的职能安排的，其中有传统的也有新引入的。当然，对于每一章，我们都试图将所讨论的问题与质量和竞争力这两大主题的关系展示给读者，并且从战略的角度分析他们之间的相互关系。

质量

我们研究与质量相关的两个主要问题：质量管理与统计质量控制（分别在第3章和

第4章中讨论)。因为在大多数企业的全面质量管理方案中,这两方面的关系极为密切,很难相互独立,所以我们把这两个问题放在一起讨论。我们在本书中较早地引入这两个概念,目的是使学生看到下面章节中涉及的职能性问题如何影响质量管理和被其影响。例如,在第5章关于“产品与服务设计”中,我们集中讨论通过充分认识全面质量管理的过程来改善设计过程;在第10章关于“预测”中,我们讨论了在企业策略设计的过程中,预测是如何与全面质量管理相关联的。

竞争

尽管大多数企业表示它们的目标是让消费者满意或不断提高质量,但它们潜在的目标都是击败竞争对手。企业通过许多手段取得竞争优势,其中之一是通过比对手更加有效地部署运作管理的各项基本职能。在每一章里,我们都会列举大量实例,以说明企业如何部署具体的运作职能,从而获取竞争优势并走向成功的。我们从第1章就开始讨论竞争问题,并将以“竞争优势”方框的形式贯穿教材的始终,以此表明成功的企业是如何通过运作管理来获取竞争优势的。

策略

企业的策略就是它获取竞争优势的战略方针。企业策略方案的成功与否,决定于该企业协调其内部职能部门的能力如何(包括生产运作部门),以及这些职能部门为企业目标服务的能力如何。在本书中,我们试图说明每一章所涉及的职能与过程是如何与企业的策略方案相匹配的。运作管理中策略的重要性将在第2章中强调,这是本版中新加入的一章,叫做“生产运作策略”,安排在本书中靠前的位置。在接下去的每一章中,我们强调对于具体运作决策对企业全局战略潜在影响进行考虑的必要性。例如,在第3章“质量管理”中,我们讨论“全面质量管理策略影响”;在第9章“供应链管理”中,我们强调“供应链设计是一个战略问题”;在第11章中,我们讨论“生产能力计划是一个长期战略决策”。

服务业与制造业

在本书中,我们试图在服务业与制造业的运作中找到一种平衡。传统观点认为,运作管理属于制造业管理范畴,许多生产管理的教材都有这样的偏误。而实际上,在美国和其他一些工业化程度较高的国家,人们已经感觉到经济发展已从以制造业为重心转向以服务业为重心。这样,服务业的运作管理与制造业的运作管理就变得同等重要了。许多情况下,服务业与制造业的运作管理技巧和过程没有太大的差别。然而,在另外一些情况下,服务业的运营中呈现出独特的情况和问题,需要人们注意并以不同的手段加以解决。我们力求在课文中提供许多针对于服务业的实例,展开当服务业与制造业经营环境有明显不同时对服务业运营的讨论,从而反映服务业运营的特别之处。例如,在第3

章“质量管理”中，我们特别针对“服务性企业全面质量管理的特殊情况”展开讨论，在第5章“产品与服务设计”中，我们强调制造业与服务业在考虑设计因素方面的不同；在第11章里，我们讨论“服务业的总体计划”。

定量与定性过程

我们也试图在运作管理的定量方面与定性方面找到一种平衡。在过去很多时候，运作管理教材看上去像是一本集合了适用于不同职能问题和不同数量性技巧的松散无序的编辑物。在当今的运作管理领域中，数量性和技术性的因素可能比过去任何时候都更加重要。然而，有效地管理人和资源的能力，激励、组织、控制和评价，特别是适应变化的能力，在今天的国际市场上已成为竞争的关键。因此，在本书中，我们将努力解释和展示成功经理人员的管理方式，以及当定量的技巧和技术可用时，经理人员如何凭借这些因素进行管理和决策。

知识特写

在本书中，我们引入了大量“特写”，希望能够帮助学生坚持和加快对教材的学习。有些“特写”与第一版中的相同；有一些则是我们新加入的。在以下的几个部分中，我们将总结一下课文中出现的几类知识特写。

课文组织

我们的重要目标之一是编写一本行文流畅的好书，辅以按逻辑顺序编排的标题，并从适当的角度来安排运作管理的不同功能。这个新的版本分为三大部分：第1章～第4章主要讨论生产系统的战略问题，这几章适度地评价了运作管理，强调了在当今竞争激烈的国际市场上战略与质量的重要性；第5章～第10章构成了一个部分，我们称为“生产系统设计”；第11章～第17章着眼于生产系统的运作。这样，从按照战略建立经营环境和确立质量方案，到为实现企业战略目标而设置经营职能，再到为了实现企业战略目标和增强在全球市场上的竞争力而生产产品和服务，本书形成了一个顺理成章的逻辑框架。

本版中新增的章节

为了使本书能够跟上当今运作管理的潮流，我们对有些章节进行了调整和变动，在某种程度上，这些章节曾在上一版中出现过。第1章新增更多全球化与竞争方面的信息。第2章“运作策略”是本版新增加的，它强调根据企业经营能力选择策略，强调联系运作管理中各个独立的方面来看待策略方面的问题。策略部署方面涉及的内容有所增加，核心竞争力以及竞争性导向策略等问题被加入书中。第5章“产品与服务设计”

后，紧跟着质量功能部署和 Taguchi 设计法。第 6 章“生产过程规划和技术决策”中，加入了过程再设计和信息技术两个新的部分。第 8 章与前一版的工作设计相比，在经营职能的人力资源管理方面提出了一种更广阔、更富有综合性的看法。在第 9 章“供应链管理”中，保留了第一版中地理位置和运输的内容，并考虑了企业的策略方案，从而达到把与这个越来越重要的问题有关的所有方面集合在一起的目的。在第 11 章中，我们将生产能力计划的涉及面放宽，使其包括了能力扩张策略和决定企业生产资源的总体水平策略。

“竞争优势”应用框

每章的课文中都有这样的方框。方框中的内容描述了一个企业或组织机构，如何使用本章所讨论的具体管理技巧或方法在全球市场环境中进行竞争。本书中共有 60 多个这样的方框，涉及了服务业和制造业、国内企业与国外企业的运作管理例子。

以实例介绍章节

每一章的开头都介绍了一个实际存在的企业，以及如何实践该章所要讨论的策略方法。这些实例首先在课文中提出，目的是为了让学生在每章开始的讨论之前，对问题有一个现实的想法。

图片

课文中包含了大量彩色图片，目的是为了增加和补充课文所表达的信息。这些照片与上述的开篇案例一同作为每章的开始；也有的图片在文章中出现，增强了文章的趣味性。每张图片都配有进一步解释的标题，以补充课文的内容。

经营性决策工具附录

本书包括了四章数量性的补充资料，主要针对较为传统的和用于运作管理的一些严格的数量分析技巧，它们是：决策分析法、运输法、线性规划和模拟实验。由于在许多情况下，学生已在其他的数量分析课程中学习过这些方法，所以这四个部分在本书中就从一般的正式章节中分离出来。另外，对于这些方法的学习需要花费较长时间，教师将会考虑不用花很多时间来讨论这些问题，而是把时间留给较为重要的运作管理问题的讨论。

页边注释

页边注释是学生在在学习过程中可能记录在页边的笔记。这些页边注释使课文中的主

要问题变得明显，便于学生找到重点在课文中的位置。页边注释对问题和重点进行总结，并且提供给读者主要概念的简单定义。

举例

课文中包含了大量的例子，主要是为了说明数量性的技巧并使读者易于理解。这些例子说明了数量性技巧的结果如何帮助经理人员进行决策。这些例子被有序地安排为“问题陈述和解法”的形式。我们也经常使用现实生活中的例子，经常引用企业的实例，并将其与每一部分的标题结合起来。

生产与经营管理软件包——用于 WINDOWS 的计算机软件

本书中的内容展示可通过一个计算机软件包——适用于 WINDOWS 的经营管理软件包 POM。本书的教师手册^①附有一张光盘。经营管理软件包可解决经营管理中所有的决策问题，它容易理解，便于使用，除了“HELP”可以直接从软件的屏幕中看到外，不需要任何预先使用的命令。生产与运作管理软件包在课文中频繁使用，以显示如何在计算机上求解例题。这一软件也可以合理价格向学生提供，每本书提供一张光盘。如果你想订购本书和光盘，请一定订购 ISBNB 0-13-667965-X，这将确保你以一个优惠的价格得到软件。如果想知道更多的详情，请与 PRENTICE-HALL 销售代表联系，或给 PRENTICE-HALL 打电话，号码是：0018-526-0485 [北京代表处电话号码是：(010) 62615862 或 (010) 62615866]。

EXCEL 工作表文件

尽管生产与运作管理软件包可用于解决几乎本书中所有数量性问题，但我们在解答书中的许多数量问题时，也使用了微软的 EXCEL 工作表文件。此工作表文件已成为日渐流行而便捷的解决运作问题的方法。然而，当我们大概列出编制工作单解决问题的基本步骤时，需要使用者具备使用 EXCEL 软件的一些基本知识。

网址和主页

通过课文页边的 WWW 图标，你可以找到企业和课文标题的网址，这样你就可以通过位于：<http://www.prenpall.com/russell> 的主页，在互联网上查到企业与课文内容的有关信息。如果你有兴趣得到某一光标所在网址的信息，只要在你的主页上找到相应的章节，将光标下移到课文页边图标的网址上，击鼠标即可。除了每章所提供的网址信息之外，学生还可以参与网络练习、实际的工厂旅行、章节讲座、相应的章节小测验，

^① 本书的教师手册版权未授与中国人民大学出版社。

以及组织学生做的项目。教授们将会有机会得到课程的构架、有注释的讲座幻灯片、可选择的例子、项目和特别的作业，以及课文中没有包含的背景资料。

LANDS'END 方框和录像

在第 10 章里，我们引入了带有简单介绍运作管理的一些主题，收录在国家书目零售公司——LANDS' END 中。贯穿全书的这种 LANDS'END 管理，鉴于这是一个服务型的企业，因而它有特殊的意义。有七个 LANDS'END 方框的内容配有录像节目，与本教材相配套。

主要公式的汇集

在每章的小节之后有“主要公式总结”，它将课文中所提到的数量性技巧的主要公式提出来，列成单子。这使得学生能够在一个特定的地方对公式进行回忆，而不必再返回到课文中去查找。这些公式也同样在网页上教师项目下列示出来，以便测验时使用。

主要概念的汇集

在每章末尾的“主要公式总结”之后，有“主要概念总结”项目。这里提供了一个本章中最重要概念的清单。这张清单使得学生不必在课文中或在边注中查找概念，就可以回忆和复习重要的概念。

已解答的例题

在每章最后有作业和问题，在此之前，专门设有一个部分演示性的例题。对例题的解答将引导学生如何完成作业。这些例题都是按步骤详细解答的。

附录

本书附有许多附录项目，教师可以在课堂上使用这些附录项。这其中包括一系列补充课文所表述内容的录像资料。有施乐公司的竞争力和持续增长；惠普公司的团队建设和雇员参与机制；KURT 制造公司的统计过程控制、过程策略和选择及弹性制造系统；惠尔浦公司的运作策略；摩托罗拉公司的产品设计和与供应商的伙伴关系；Mattiott 公司的服务质量和设计；Winnebago 的工厂观览，以及七个部分有关 LANDS'END 的录像，这些录像资料在何处使用，以及每盘录像的介绍都在网址和教师手册中有所说明。

教师手册包含了大量信息，从而帮助教师在经营管理方面准备多样化的介绍课程，

并讲授给学生，其中包括：简单的教学进度、章节目录、讲课要点、幻灯片、与课文中所举例不同的例子、课堂练习、研究项目及特定的课后作业等。

同样包含在本书中的还有问题解决手册，包含了对章节后问题、课后作业及案例问题的详细解答。

致谢（略）

**罗伯塔·S·拉塞尔
伯纳德·W·泰勒**

ABOUT THE AUTHORS



Bernard Taylor and Roberta Russell

Bernard W. Taylor, III, is the R. B. Pamplin Professor of Management Science and Head of the Department of Management Science and Information Technology in the Pamplin College of Business at Virginia Polytechnic Institute and State University. He received the Ph.D. and M.B.A. from the University of Georgia and B.I.E. from the Georgia Institute of Technology. He is the author of the book *Introduction to Management Science* (5th ed.) and co-author of *Management Science* (4th ed.), both published by Prentice-Hall. Dr. Taylor has published over eighty articles in such journals as *Operations Research*, *Management Science*, *Decision Sciences*, *IIE Transactions*, *Journal of the Operational Research Society*, *Computers and Operations Research*, *Omega*, and the *International Journal of Production Research* among others. His paper in *Decision Sciences* (with P. Y. Huang and L. P. Rees) on the Japanese kanban production system received the Stanley T. Hardy Award for its contribution to the field of production and operations management. He has served as President of the Decision Sciences Institute (DSI) as well as Associate Program Chair, Council Member, Vice President, Treasurer, and as the Editor of *Decision Line*, the newsletter of DSI. He is a Fellow of DSI and a recipient of their Distinguished Service Award. He is a former President, Vice-President, and Program Chair of the Southeast Decision Sciences Institute and a recipient of their Distinguished Service Award. He teaches management science and production and operations management courses at both the undergraduate and graduate level.

He has received the University Certificate of Teaching Excellence on four occasions, the R. B. Pamplin College of Business Certificate of Teaching Excellence Award, and the R. B. Pamplin College of Business Ph.D. Teaching Excellence Award at Virginia Tech.

Roberta S. Russell is Professor of Management Science and Information Technology. She received the Ph.D. from Virginia Polytechnic Institute and State University, an M.B.A. from Old Dominion University, and a B.S. degree from Virginia Polytechnic Institute and State University. Dr. Russell's primary research and teaching interests are in the areas of production and operations management, service operations management, simulation, and quality. She has published in *Decision Sciences*, *IIE Transactions*, *The International Journal of Production Research*, *Material Flow*, *Business Horizons*, *Computers, Environment and Urban Systems*, *Computers and Operations Research* and others. She is also co-author of the Prentice-Hall text, *Service Operations Management*. Dr. Russell is a member of DSI, TIMS, ASQC, and IIE, and a certified fellow of APICS. She is Past President of the Southwest Virginia Chapter of APICS and has held numerous offices in Southeast DSI. She has received the R. B. Pamplin College of Business Certificate of Teaching Excellence, the University Certificate of Teaching Excellence, and the MBA Association's Outstanding Professor Award. She is also listed in Outstanding Young Women of America and is a recipient of the Virginia Tech Outstanding Young Alumna Award.

Preface

We originally embarked on this project to create a textbook in operations management with several objectives in mind. First, we wanted the text to be eminently readable for the student—clear, concise, and organized. We also wanted to include lots of features and examples to make the topics interesting. Next, we wanted the concepts we describe to be logical and easy to understand. We wanted to make efficient use of the English language to avoid drowning straightforward topics in a sea of verbiage or a blizzard of mathematical notation. And most important, we wanted the student to feel excited about operations management because we live in an exciting time with many new, unique, and interesting changes occurring in manufacturing and service operations around the world.

We like to think that we accomplished these objectives to a large degree in our first edition, but there is always room for improvement in a project like this, so much of this second edition focuses on how to better achieve these objectives and achieve new ones.

MAJOR TEXT THEMES

We have sought to make our textbook contemporary and comprehensive. There are many new and important changes taking place in operations management today, and we want to make sure that they are conspicuously integrated with the more traditional topics in OM. That's why we focus a lot of our attention on *quality* and *competitiveness*, and their implications for *strategy*, as consistent themes throughout the text. We do not believe that quality is simply a recent trend, but rather a pervasive philosophy that impacts on and influences all the other topics and functions in operations management. Quality has become an especially important part of a company's overall strategy to compete in today's global market. For many companies, their total quality management program (TQM) is the engine that drives their strategic plan.

Operations managers make decisions in functional areas such as product and service design, facility layout and location, planning and scheduling, and supply chain management based on how effectively these decisions fit together in a strategic design to achieve the firm's goals. The chapters in this text are organized around functional topics, some new and some traditional. However, in each case we attempt to show how these topics are connected to the common themes of quality and competitiveness, and then are connected to each other in terms of strategy.

Quality

We cover our two primary topics related to quality, Quality Management and Statistical Quality Control, in Chapters 3 and 4, respectively. We put these topics together because in most companies they are so closely interrelated in an overall total quality management program that it is hard to consider one separate from the other. We introduce them early in the text so that the student can see how the functional topics in subsequent chapters are affected by, and affect, quality management. For example, in Chapter 5 on Product and Service Design our discussion focuses on Improving the Design Process through well-recognized TQM processes, and, in Chapter 10 on Forecasting we discuss how forecasting is related to TQM in a company's strategic design process.

Competitiveness

Although most firms express their goals in terms of customer satisfaction or level of quality, their underlying objective is to beat out their competitors. One way in which companies can gain a competitive edge is by deploying the basic functions of operations management in a more effective manner than their rivals. In each chapter we give numerous examples of how companies deploy specific operations functions in a way that has provided them with a competitive edge and made them successful. We begin our discussion of competitiveness in Chapter 1 and continue throughout the text with “Competitive Edge” boxes describing how successful companies have gained a competitive edge through operations.

Strategy

A company’s battle plan for achieving a competitive edge is its strategy. The success of a strategic plan is determined by how well a company coordinates all of its internal functions, including operations, and brings them to bear on its goals. Throughout the text we try to show how the functions and processes described in each chapter fit into a company’s strategic plan. The importance of strategy in operations management is emphasized by our creation of a new Chapter 2—Operations Strategy—and its placement up front in the text. In each subsequent chapter we emphasize the need for considering the overall strategic implications of particular operating decisions. For example, in Chapter 3 on Quality Management we discuss the “strategic implications of TQM,” in Chapter 9 on Supply Chain Management we emphasize that “supply chain design is a strategic issue,” and in Chapter 11 we discuss “capacity planning as a long-term strategic decision.”

Services and Manufacturing

We have attempted to strike a balance between manufacturing and service operations in our text. Traditionally operations management was thought of almost exclusively in a manufacturing context, and OM texts frequently reflect this bias. However, in the United States and other highly industrialized nations, there has been a perceptible shift in the economy toward service industries and away from manufacturing. Thus, managing service operations has become equally as important as managing manufacturing operations. In many cases, operations management techniques and processes are indistinguishable between service and manufacturing. However, in many other instances, service operations present unique situations and problems that require focused attention and unique solutions. We have tried to reflect the uniqueness of service operations in our text by providing numerous examples that address service situations, and by providing focused discussions on service operations when there is a clear distinction between operations in a service environment and in a manufacturing environment. For example, in Chapter 3 on Quality Management we specifically address the unique conditions of “TQM in service companies”; in Chapter 5 on Product and Service Design; we emphasize the differences in design considerations between manufacturing and services; and in Chapter 11, we discuss “aggregate planning in services.”

Quantitative versus Qualitative Processes

We have also attempted to strike a balance between the quantitative aspects of operations management and the qualitative (or behavioral) aspects. Too often in the past, OM texts have presented themselves as a loose compilation of different quantitative

techniques applied to various functional topics. In the contemporary world of operations management, the quantitative and technological aspects are probably more important than ever. However, the ability to manage people and resources effectively, to motivate, organize, control, evaluate, and particularly to adapt to change, have become critical to competing in today's international markets. Thus, throughout this text we seek to explain and demonstrate how the successful operations manager manages, and when quantitative techniques and technology are applicable, how they are used to help manage and make decisions.

LEARNING FEATURES

We have introduced many features in our text which we hope will help sustain and accelerate the student's learning of the material. Some of these features remain from the first edition while others are new to this edition. In the following sections we summarize the various learning features that appear in the text.

Text Organization

One of our most important objectives is to have a well-organized text that flows smoothly, follows a logical progression of topics, and places the different functions of operations management in their proper perspectives. We have organized this new edition of our text into three groupings. The first four chapters focus on *The Strategy of Productive Systems*. These chapters seek to place operations management in a proper perspective and emphasize the importance of strategy and quality for competing in today's highly competitive global marketplace. Chapters 5 through 10 comprise a group we refer to as *Designing Productive Systems*, while Chapters 11 through 17 focus on *Operating Productive Systems*. Thus a logical flow is created from strategically establishing the operating environment and defining a quality program, to designing the operations function to meet the company's strategic goals, and finally to producing the product or service that will achieve the strategic goals and enable a company to compete in a global market.

New Chapters in This Edition

In an effort to keep our book current and abreast of contemporary trends in operations management we have altered several chapters, some to the extent that they appear for the first time in this edition. Chapter 1 contains more information on globalization and competitiveness. Chapter 2 on Operations Strategy is new and emphasizes the importance of making strategic choices consistent with operational capabilities, as well as looking at the strategic issues associated with individual topics in OM. The coverage of policy deployment has been increased and topics such as core competencies, core rigidities, and competency-based strategies have been added. Chapter 5 on Product and Service Design has been streamlined with tightened discussions of Quality Function Deployment and Taguchi methods of design. Chapter 6 on Process Planning and Technology Decisions has been enhanced with new sections on process re-engineering and information technology. Chapter 8 provides a broader, more comprehensive view of human resource management within the operations function than the chapter on job design from the previous edition. Chapter 9 on Supply Chain Management attempts to pull together the related components of this increasingly important topic by looking at its strategic design, while retaining some of the topics from the previous edition on location and transportation. In Chapter 11 we expanded coverage of capacity

planning to include strategies for capacity expansion and for determining the best overall level of productive resources for a firm.

"The Competitive Edge" Application Boxes

These boxes are located in every chapter in the text. They describe how a company, organization, or agency uses the particular management technique or function being discussed in the chapter to compete in a global environment. There are more than 60 of these boxes throughout the text and they encompass a broad range of service and manufacturing operations, foreign and domestic.

Chapter Introductory Applications

Each chapter begins with a description relating the subject of the chapter to an actual application in a company. These applications are provided first to give the reader a realistic perspective of the topic before embarking on its discussion.

Photos

The text includes a variety of color photographs that enhance and complement the presentation of the written textual material. These photos accompany the introductory application that starts off each chapter, as well as various other points of interest within the body of the chapters. Each photo is accompanied by an extensive descriptive caption that complements the text material.

Operational Decision-Making Tools Supplements

The text includes four quantitative chapter supplements that address some of the more traditional and mathematically rigorous quantitative techniques used in operations management: *decision analysis*, *linear programming*, *transportation solution methods*, and *simulation*. These topics have been segregated from the normal chapters because in many instances students already will have studied them in a separate quantitative methods course. In addition, their study can be time-consuming and often the instructor will prefer not to take time from the coverage of other important OM topics.

Marginal Notes

Notes that are included in the margins serve the same basic function as notes that students themselves might write in the margin. They highlight certain topics to make it easier for the student to locate them, they summarize topics and important points, and they provide brief definitions of key terms and concepts.

Examples

Examples are liberally inserted throughout the text, primarily to demonstrate quantitative techniques and to make them easier to understand. The examples illustrate how the results of the quantitative technique may be used to help the manager make decisions. The examples are organized into a problem statement and solution format. We also make frequent use of real world applications, often citing the experiences of companies as they relate to individual topics.

POM for Windows Computer Software

This text features illustrations from a computer software package, *POM for Windows*. A disk is packaged with each *instructor's* complimentary copy of this text. *POM for Windows* is very user-friendly software that solves problems in all the decision-making areas of operations management. It is easy to understand and use, requiring virtually no preliminary instruction except for the "help" screens that can be accessed directly from the program. *POM for Windows* is used frequently in the text to show how to solve example problems on the computer. This software can be packaged—at a reasonable additional cost to students—with each copy of the text. If you wish to order this software with the text, please be sure to order ISBN 0-13-667965-X, as this will ensure that you get the software at a discounted price. For further details, contact your Prentice Hall sales representative or phone Prentice Hall at 1-800-526-0485.

Excel Spreadsheets

Although *POM for Windows* can be used to solve almost any quantitative problem in the text, we also solve many of the quantitative examples in the text with the Microsoft Excel spreadsheet program. Spreadsheets have become an increasingly popular and convenient means for solving operational problems. However, while we generally outline the basic steps for setting up a spreadsheet and solving a problem with Excel, some basic, fundamental knowledge of the Excel program is usually required.

Web Sites and Home Page

Throughout the text WWW icons in the margins (as shown at right) identify companies and topics that can be accessed on the internet through our text home page located at <http://www.prenhall.com/russell>. If you are interested in accessing one of the highlighted web sites simply go to the appropriate text chapter on our home page and scroll down to the web site identified by the icon in the margin of the text and click on it. In addition to the web site links provided for each chapter, students will be able to access Internet exercises, virtual factory tours, chapter lectures, interactive chapter quizzes, and sample student projects. Faculty members will be able to access sample course outlines, annotated lecture slides, alternate examples, projects and special assignments, and in-depth background material not included in the text.



Lands' End Boxes and Videos

In ten of the chapters we illustrate various subjects and topics with brief descriptions of operations at Lands' End, the national catalogue retailer. These boxes are similar to "The Competitive Edge" boxes used throughout the text. Taken together, they have the advantage of describing operations across the breadth of an entire company and since it is a service company, they are particularly insightful. Seven of the Land's End boxes are accompanied by video programs that accompany the text.

Summary of Key Formulas

Following the summary at the end of each chapter is a "Summary of Key Formulas" that provides a list of the most important formulas derived in the presentation of any quantitative techniques introduced in the chapter. These enable the students to turn to a specific location to refresh their memories about a formula without having to