

技术创新的战略管理

（美）Melissa A. Schilling 著

Strategic Management of Technological Innovation



清华大学出版社

第一套

根据中国工商管理本科大纲要求、教学实践进行详细精简的本科英文教材

适合中国国情及国际化双轨要求的双语教学英文教材

为中国应用型商科教育发展奠定教学模式及基础的英文版商科教材

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本书体系完整,内容全面,囊括了很多经典内容,如S曲线、技术创新中的合作模式、技术价值的保护、开发团队的组织形式等。题材新颖,既有最新的案例,也有标准战等技术创新管理理论中的新内容。作者在每章以案例开篇提出问题,每章有小结、有思考题,便于安排教学。

本书适合作为MBA、研究生、本科生的技术创新管理课程教学的教材,也可供相关领域的人员作为参考书籍。

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出 版 说 明

为了适应经济全球化的发展趋势,满足国内广大读者了解、学习和借鉴国外先进经济管理理论和管理经验的需要,清华大学出版社与国外著名出版公司 McGraw-Hill 教育出版集团合作影印出版了一系列商科英文版教材。清华大学经管学院的谢伟老师和王毅老师帮助我们挑选了本书,谢伟老师还在百忙之中抽出时间完成了前言、目录和术语等内容的翻译工作。我们对谢伟老师和王毅老师的支持、帮助和鼓励,在此表示谢意!

由于原作者所处国家的政治、经济和文化背景等与我国不同,对书中所持观点,敬请广大读者在阅读过程中注意加以分析和鉴别。

我们期望这套影印书的出版对我国经济管理科学的发展能有所帮助,对我国商科的教学,尤其是商学本科的教学能有所促进。

欢迎广大读者给我们提出宝贵的意见和建议;同时也欢迎有关专业人士向我们推荐您所接触到的国外优秀图书。

清华大学出版社经管事业部

2005. 1

中国的学生要不要使用英文版的教材,一直有争议。有人认为,我们应该使用自己编写的教材,这样才能更准确地反映我们在课堂上所要表达的观点。用国外的原版教材,有些隔靴搔痒,不能解决中国的实际问题。持不同意见的观点认为,尽管各国在管理体制上有意识、制度、文化等差异,但管理本身是在国际环境下具有共同性的问题。特别是,中国的企业在经济全球化的环境下,需要更多地了解国外的管理理论与现状。在这种情况下,就需要引进一些外版的教材。一则,用于满足我们教学的部分需求;二则,更好地了解外版教材的教学服务体系;三则,为我们的师生创造英语教学的环境。

在进行2004年本科教指委的工作规划时,我曾特别谈及,要加强对本科教育中教书育人、服务于学生的使命的认识,继续优化专业课程设计,扩大精品课程建设,增加专业导向课程。同时,还要加强对国际商科与经济管理学科教学进展的研究,并引进最新的教学成果,包括教材及教学资源。这一切都是为了更好地为国家与社会培养更好的人才。

为此,清华大学出版社与美国麦格劳·希尔教育出版公司的合作,引进出版这套“精编版”的英文工商管理教材,也是体现这一理念。这套教材吸收国际最新教学成果,提供全方位的教学资源,并借助英语的语言媒介,将会大力提升与发展中国工商管理教学水平,提高学生使用英语语言和网络手段获得长久的终生学习的能力和兴趣,进而提高我国工商界的国际竞争力。这是一件具有重大意义的工作。

讲到美国麦格劳·希尔教育出版公司,就要提到该公司的中国首席代表姜峰先生。我同他认识已经多年了。1995年,他供职西蒙与舒斯特公司北京代表处。从那时起,他便开始来学校拜访,打破出版社坐等教师上门的惯例。他这种服务教学的理念就是直接同我们的教师见面,为教师提供教学资源,从早期的印刷版图书到磁盘、光盘,到在线资源、在线系统。这些年,姜峰先生尽管已经换到目前的公司工作,但他始终坚持着这一服务教学的理念,认真实践着他的教育出版观。

在同姜峰先生讨论引进国际上在工商管理教学的最新成果时,基本上确定了引进本套教材及教学资源的基本格调,即对“国际最新教学成果”的几个共同认识:一是国际上教学技术的进展究竟走到了哪一步,我们就引进到哪一步;二是要注意教学技术的发展给教学及教材带来的影响,我们要借鉴新的教学辅助手段。

最近几年,我在美国授课的过程中,注意到教学网络技术:CMS(课程管理系统)。通过这个教学辅助系统,教师可以将所要讲授的课程内容简单地张贴到一个系统化的网页上,包括教学演示文件PPT、章节提要(Lecture Notes)、在

线阅读资料,以及问答题、简答题还有课后大作业等,还可以很简单地开设自己课程的在线论坛BBS。学生在注册后,便成为在线学生,通过该平台与教师交互,完成习题、在线提交作业,在线考试,自动出评测分析报告。这一切是以教师为中心,完全解决了教师对于自己教学内容,以及对学生和教学过程的网络化数字化管理的问题,并可多次复用、异地复用。这个在线学习系统(BlackBoard, WebCT, eCollege)等不同于国内各高校自己研发的以学籍管理或基于录像、课件的远程教学为中心的校园管理平台,直接解决大学的核心问题,即“大师”们对课程教学内容的管理问题,成为对教师授课最好的在线数字化辅助支持平台。

2003年12月底,从姜峰先生处得知BlackBoard在中国落地,便通过他与赛尔毕博公司接触,很快决定在中国人民大学商学院引进该平台支持教学。2004年的春季学期,我商学院247位教师,所有364门课程全面上线,2000多名学生在线注册学习,引发了人大商学院一场真正意义上的“教学革命”。教师与学生实现了很好的沟通与互动,学生之间也有了很好的学习谈论的天地。目前,我商学院的经验,已经成为赛尔毕博支持国内院校教学上线发展的典范,成为BlackBoard在国内的示范教学网站。

课堂教学同网络平台结合之后,又给教学带来了新的挑战,也给教材和教材的出版商们带来了新的机遇。历史悠久的麦格劳-希尔教育出版公司积极适应这种挑战,在商科及经管教材的出版上做了战略性的调整:即将教材本身做“薄”,出版一批新型的、跨媒介的教材;将研讨性、探索性、展开式的学习内容放到网上,将动态交互性的内容放到网上;印刷版的教材从过去强调各章节内容全面,呈现教学过程、学习环节,转向注重概念性及引导性,展现学习的核心内容。同时,他们将教材配套的教学资源做得更“全”,将更多的内容上线后全面依托网络,更加动态地呈现教学内容及教学过程;并为不同的教学平台提供完全解决方案,提供跨平台的不同版本的内容“子弹”。无论采用BlackBoard还是WebCT等平台,教师们都可以从出版商处获得标准的教学资源包,为自己采用的教材轻松搭建课程网站,实现教学的在线革命。

总之,教学在革命,教学的手段也在革命。我们要看到工商管理教学在国际上的各种变化,努力跟上时代的发展变化,使我们的学生真正获得国际水准的教育。为此,我衷心地感谢这批教材的国外作者们,正是他们不懈的教学实践,给我们学科的发展带来源源的活力;同时感谢国内外的出版界人士,感谢他们对教材、教材市场的永恒追求,不断地帮助我们提升教学的水准;衷心希望这批适应新的教学需要的国际最新教材的出版能抛砖引玉,再次带动整个工商管理教育,无论是本科、高职高专教学 还是 MBA、EMBA 教学的发展。

子曰:“学而时习之,不亦说乎。”在这场教学革命中,我们有更大的勇气面临新的教学挑战,将中国的工商管理教育推向世界一流的前列!

徐二明

教育部高校工商管理类教学指导委员会主任委员
中国人民大学商学院院长

2004年金秋于北京

创新是美好的。它是一种既带有美感又具有实用性之诱惑的力量：它能释放我们的创造精神、开启我们的心灵，以通向迄今为止未曾梦想到的可能性，同时，它能够经济增长提速，并推动人类在诸如医药、农业、教育等关键领域的进步。对于西方世界创新的根本发动机即工业组织来说，创新不仅提供了难得的机会，也对其提出了严峻的挑战。创新不仅是竞争差别化的有效方法，它帮助企业进入新市场并实现更高的边际收益，同时它还是速度、技能和准确性的较量。对于一个企业来说，光有创新性并不够，要成功，它必须比其竞争对手创新得更好。

为了更好地理解创新，学者和管理者们争先恐后，关于此话题的一系列研究工作在一些学科中已经出现并得到了繁荣发展，例如战略管理、组织理论、经济学、营销学、工程和社会学。这方面的研究工作已经产生了一系列洞见，例如创新如何影响市场竞争的动态、企业如何战略性地管理创新以及企业如何实施其创新战略以最大化其成功的可能性等。文献散布于不同研究领域的重要好处，是我们已经从不同的角度对其进行了研究。当然，文献分散化对教育者和学生来说，也提出了集成化的挑战。本书力图将这些工作集成到一个一致性的战略框架中，以提供严谨的、包容性强的且易为学生们理解的内容。

本书将创新管理问题作为一个战略过程来探讨。本书的框架设计力图显示目前大多数战略教科书中的战略过程，它起源于对竞争动态的评估，随后进入战略形成和战略实施。本书的第一部分覆盖了创新动态性的基础框架和启示，以帮助管理者更好地诠释其所处的技术环境并识别有意义的趋势。本文的第二部分开始于企业战略方向的探讨和创新战略的形成过程，包括项目选择、合作战略和保护企业知识产权的战略。第三部分涵盖了创新实施的过程，包括组织结构对创新的作用、新产品开发过程管理和企业战略部署的形成。本书一方面强调了实际应用和案例，另一方面也包容了现有的研究并且提供了指导进一步阅读的尾注。

本书力图成为创新战略管理和新产品开发课程的基础教材。商业和工程类教学项目中，一般都会包含此类课程。因此，本书在写作中，始终关注商业和工程类学生的需求。例如，本书的第6章“界定组织的战略方向”中，介绍了战略分析的基本工具，商学院学生对此也许已经非常熟悉，但是工学院的学生就未必如此。同样，第10章“新产品开发过程管理”的一些内容如计算机辅助设计和质量功能部署，对于信息系统和工程类学生，可能是复习材料，但对于管理类学生却是新的。本书的章节安排是自成体系的，如果教师选择以“自助餐”的方式来教学，他们可以从本书中挑选其偏好的材料。

About the Author

Melissa A. Schilling, Ph.D.

Melissa A. Schilling is an associate professor of management at the Stern School of Business, New York University. Professor Schilling earned a B.S. in business from the University of Colorado in 1990 and a Ph.D. in strategic management from the University of Washington in 1997. She worked as an assistant professor for Boston University for four years before joining Stern. She recently won a National Science Foundation Early CAREER award that includes a grant to support her research for the next five years. She also won the Broderick prize for research while working at Boston University.

Professor Schilling's research focuses on technological innovation and knowledge creation. She has studied how firm's fight technology standards battles, and how they utilize collaboration, protection, and timing of entry strategies. She also studies how product designs and organizational structures migrate toward or away from increasing modularity. Her most recent work focuses on knowledge creation, including how variation (rather than specialization) can accelerate the learning curve, and how the structure of knowledge networks affects their overall capacity for knowledge creation.

Professor Schilling has published articles in a wide range of journals, including *Academy of Management Journal*, *Academy of Management Review*, *Management Science*, and *Organization Science*. She teaches Strategic Management and Technological Innovation Management in the undergraduate and MBA programs at the Stern School.

Preface

Innovation is a beautiful thing. It is a force with both aesthetic and pragmatic appeal: It unleashes our creative spirit, opening our minds to hitherto undreamed of possibilities, while simultaneously accelerating economic growth and providing advances in such crucial human endeavors as medicine, agriculture, and education. For industrial organizations, the primary engines of innovation in the Western world, innovation provides both exceptional opportunities and steep challenges. While innovation is a powerful means of competitive differentiation, enabling firms to penetrate new markets and achieve higher margins, it is also a competitive race that must be run with speed, skill, and precision. It is not enough for a firm to be innovative—to be successful it must innovate better than its competitors.

As scholars and managers have raced to better understand innovation, a wide range of work on the topic has emerged and flourished in disciplines such as strategic management, organization theory, economics, marketing, engineering, and sociology. This work has generated many insights about how innovation affects the competitive dynamics of markets, how firms can strategically manage innovation, and how firms can implement their innovation strategies to maximize their likelihood of success. A great benefit of the dispersion of this literature across such diverse domains of study is that many innovation topics have been examined from different angles. However, this diversity also can pose integration challenges to both instructors and students. This book seeks to integrate this wide body of work into a single coherent strategic framework, attempting to provide coverage that is rigorous, inclusive, and accessible.

The subject of innovation management is approached here as a strategic process. The outline of the book is designed to mirror the strategic management process used in most strategy textbooks, progressing from assessing the competitive dynamics of the situation, to strategy formulation, and then to strategy implementation. The first part of the book covers the foundations and implications of the dynamics of innovation, helping managers and future managers better interpret their technological environments and identify meaningful trends. The second part of the book begins the process of crafting the firm's strategic direction and formulating its innovation strategy, including project selection, collaboration strategies, and strategies for protecting the firm's property rights. The third part of the book covers the process of implementing innovation, including the implications of organization structure on innovation, the management of new product development processes, the construction and management of new product development teams, and crafting the firm's deployment strategy. While the book emphasizes practical applications and examples, it also provides systematic coverage of the existing research and footnotes to guide further reading.

This book is designed to be a primary text for courses in the strategic management of innovation and new product development. Such courses are frequently taught in both business and engineering programs; thus, this book has been written with the needs of business and engineering students in mind. For example, Chapter Six

(Defining the Organization's Strategic Direction) provides basic strategic analysis tools with which business students may already be familiar, but which may be unfamiliar to engineering students. Similarly, some of the material in Chapter 10 (Managing the New Product Development Process) on computer-aided design or quality function deployment may be review material for information system students or engineering students, while being new to management students. Though the chapters are designed to have an intuitive order to them, they are also designed to be self-standing so instructors can pick and choose from them "buffet style" if they prefer.

This book arose out of my research and teaching on technological innovation and new product development over the last decade; however, it has been anything but a lone endeavor. I owe much of the original inspiration of the book to Charles Hill, who helped to ignite my initial interest in innovation, guided me in my research agenda, and ultimately encouraged me to write this book. I am also very grateful to colleagues such as Juan Alcacer, William Baumol, Gary Dushnitsky, Tammy Madsen, Goncalo Pacheco D'Almeida, Raghu Garud, Bill Starbuck, and Christopher Tucci for their suggestions, insights, and encouragement. I am also thankful to my editors, Ryan Blankenship and Lindsay Harmon, who have been so supportive and made this book possible, and to the many reviewers whose suggestions have dramatically improved the book:

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I also need to thank my husband, Alex, for his love and support despite my neglect of him during the writing of this book. Finally, the biggest debt of gratitude is certainly owed to the many students of the Technological Innovation and New Product Development courses I have taught at New York University, Boston University, and University of California at Santa Barbara. Not only did these students read, challenge, and help improve many earlier drafts of the work, but they also contributed numerous examples that have made the text far richer than it would have otherwise been. I thank them wholeheartedly for their patience and generosity.

Melissa A. Schilling

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