PART 2

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Research and development by firms

ANSWERS TO DISCUSSION QUESTIONS

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Chapter 1

1. **Why is innovation so important for firms to compete in many industries?为什么创新对许多行业的企业竞争如此重要?**

Innovation enables firms to:

-introduce more product and service variations, enabling better market segmentation and penetration;

-improve existing products and services so that they provide better utility to customers;

-improve production processes so that products and services can be delivered faster and at better prices.

Increasing globalization has both expanded the potential markets for many firms while simultaneously exposing them to greater competition; this has resulted in firms putting more emphasis on innovation as a lever of competitive differentiation. Furthermore, information technology has enabled such process innovations as CAD/CAM, rapid prototyping, and flexible manufacturing, enabling firms to produce more product variants faster and cheaper. This is a double edged sword: it has enabled product lifecycles to shorten (making rapid innovation more imperative) while simultaneously improving a firm's options for innovation.

创新使企业能够:-引入更多的产品和服务变化，实现更好的市场细分和渗透;
-改进现有产品和服务，使其能更好地为客户提供服务;
-改进生产流程，提高产品和服务的交付速度和价格。
日益全球化既为许多公司扩大了潜在市场，同时又使它们面临更大的竞争;
这导致公司更加强调创新作为竞争差异化的杠杆。
此外，信息技术使CAD/CAM、快速原型和柔性制造等工艺创新成为可能，使企业能够更快、更廉价地生产更多的产品变体。
这是一把双刃剑:它缩短了产品的生命周期(使快速创新变得更加迫切)，同时也改善了企业的创新选择。

2. What are some of the advantages of technological innovation? Disadvantages?
技术创新有哪些优势?缺点呢?

Technological innovation increases knowledge, and makes more options available. On the whole, evidence suggests that technological innovation has increased GDP and standards of living worldwide. Technological innovation also, however, poses some risk of negative externalities, e.g.,
-pollution;
-agricultural and fishing technologies can result in the erosion, elimination of natural habitats, and the depletion of ocean stocks;
-medical technologies can result in unanticipated consequences such as antibiotic-resistant strains of bacteria and viruses, or moral dilemmas regarding the use of genetic modification such as externalities.
Students may also suggest that technological innovation may (or has) lead to the loss of diversity in culture and traditions. The instructor may wish to encourage them to debate such risks of innovation versus the ways that innovation has enhanced our lives.

技术创新增加了知识，提供了更多的选择。

总体而言，有证据表明，技术创新提高了全球GDP和生活水平。

但是，技术创新也会带来一些负外部性风险，例如:污染;

-农业和渔业技术可能导致侵蚀、自然生境的消失和海洋资源的枯竭;

-医疗技术可能导致意想不到的后果，如细菌和病毒的耐抗生素菌株，或有关使用基因修饰的道德困境，如外部性。

学生们可能还认为，技术创新可能(或已经)导致文化和传统的多样性丧失。

老师可能希望鼓励他们就创新带来的风险与创新改善我们生活的方式进行辩论。

3. Why do you think so many innovation projects fail to generate an economic return?

你认为为什么这么多创新项目不能产生经济回报?

Innovation is an inherently risky undertaking. Most innovation projects are characterized by both technical uncertainty (will the project result in a technically feasible product or service?) and market uncertainty (what features will customer prefer and what will they be willing to pay for them?) In their eagerness to innovate, firms are at risk of undertaking too many projects, overestimating their potential returns and underestimating their uncertainty. This is compounded by the fact that many people mistakenly believe that creativity can only be tapped through an unstructured process, when in fact innovation is most powerful and has a greater likelihood of success when it is planned and implemented strategically.

创新是一项固有的冒险事业。

大多数创新项目的特点是技术不确定性(项目会产生技术上可行的产品或服务吗?)和市场不确定性(客户会喜欢什么特性，他们愿意为这些特性支付什么?)

由于急于创新，企业面临着承担过多项目、高估潜在回报和低估不确定性的风险。

许多人错误地认为，创造力只能通过非结构化的过程来发挥，而事实上，当创新经过战略规划和实施时，它才是最强大的，成功的可能性更大的。

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Chapter 2

1. **What are some of the advantages and disadvantages of a) individuals as innovators, b) firms as innovators, c) universities as innovators, d) government institutions as innovators, e) nonprofit organizations as innovators?**
This is an ideal time to create a table on the board and encourage students to contribute advantages and disadvantages of each source individually, such as the one below:

	Advantages	**Disadvantages**
Individuals	Many creative ideas originate individuals; Users may best understand their own unmet needs; Users may have great incentive to solve their own problems; Etc. 许多创意来自个人; 用户可能最了解他们自己未满足的需求; 用户可能有很大的动力去解决他们自己的问题;等。	Individuals often have very limited capital resources to invest in an innovation project; Many innovations require a broader range of knowledge and skills than any individual possesses; Etc. 个人通常有非常有限的资本资源来投资一个创新项目; 许多创新需要比任何人都更广泛的知识和技能;等。
Firms	Significant capital to invest; Complementary assets to produce, distribute, etc.; Management systems to organize innovative efforts, Etc. 需要大量资金投资; 补充性资产的产生、分配等; 组织创新努力的管理系统，等等。	May reject projects that don't appear to have an immediate commercial return; May base project choices on commercial return rather than importance to customers or society; Etc. 可能会拒绝那些看来不会立即获得商业回报的项目; 项目选择可能基于商业回报，而不是对客户或社会的重要性;等。
Universities	Typically have extensive knowledge and other resources; Can often invest in long-term or risky projects for purposes of advancing science (rather than being pressured for immediate commercial return); Often have ties to multiple other external entities (e.g., government, non-profits, etc.) 具有广泛的知识和其他资源;	May pursue esoteric projects rather than those with immediate applications; May lack skills or resources to implement innovations in the marketplace, Etc. Lack of financial discipline may lead to less efficient development processes. 可能追求深奥的项目，而不是那些有即

	通常可以投资长期或有风险的项目，以促进科学发展(而不是迫于压力，以获得直接的商业回报); 通常与多个外部实体(如政府、非营利组织等)有联系。	时应用的项目; 可能缺乏在市场中实施创新的技能或资源，等等。 缺乏财务纪律可能导致发展过程效率低下。
Government	Like universities, may have extensive knowledge and other resources; and Can often invest in long-term or risky projects for purposes of advancing science (rather than being pressured for immediate commercial return); Typically has great influence over other stakeholders or contributors to innovation (e.g., universities, firms, non-profits); Etc. 像大学，可能有广泛的知识和其他资源;和 通常可以投资长期或有风险的项目，以促进科学发展(而不是迫于压力，以获得直接的商业回报); 典型地对其他利益相关者或创新贡献者(例如，大学、公司、非营利组织)有很大的影响力;等。	May lack complementary resources to implement innovation in the marketplace; Lack of financial discipline may lead to less efficient development processes, Etc. 可能缺乏在市场中实施创新的互补资源; 缺乏财务纪律可能会导致开发过程效率低下，等等。
Nonprofits	Often have ties to multiple other external entities (e.g., universities, non-profits, etc.); May have mission-based focus that enables them to pursue long-term or risky projects; May have credibility advantages for eliciting the cooperation of other stakeholders; Etc. 经常与多个外部实体(如大学、非营利组织等)有联系; 可能有基于任务的关注点，使他们能够追求长期或有风险的项目; 可能具有吸引其他利益相关者合作的信誉优势;等。	May be reliant on external sources of funding such as charitable donations or grants, which can constrain capital resource; May lack complementary resources to implement innovation in the marketplace; Etc. 可能依赖于外部资金来源，如慈善捐款或赠款，这可能会限制资本资源; 可能缺乏在市场中实施创新的互补资源;等。

2. **What traits appear to make individuals most creative? Are these the same traits that lead to successful inventions?** 什么样的特质使人最有创造力?这些都是导致发明成功的相同特征吗?

An individual's creative ability is a function of their intellectual abilities, knowledge, style of

thinking, personality, motivation, and environment. In addition, an individual with only a moderate degree of knowledge of a field might be able to produce more creative solutions than an individual with extensive knowledge of field. The most creative individuals prefer to think in novel ways of their own choosing, and can discriminate between important problem and unimportant ones. The personality traits deemed most important for creativity include self-efficacy, tolerance for ambiguity, and a willingness to overcome obstacles and take reasonable risks. Intrinsic motivation has also been shown to be very important for creativity.

Innovation is, however, more than the generation of ideas. It is the implementation of those ideas into some new device or process. Evidence suggests that not all inventors are innovators. In fact many ideas have been left on the drawing board, so to speak, or in the inventors' garage. The entrepreneurial skills necessary to convert an idea into a new product or process are very different from the skills and thinking orientation that generated the original idea. An inventor usually will have a tendency toward introversion that may make it difficult for them to convey their ideas to others. As we saw in the Segway case the company addresses the need to incorporate both sets of skills to achieve innovation by forming teams with a mix of "ideation" and "execution" people in acknowledgement of finding all these skills in one individual.

一个人的创造能力是智力、知识、思维方式、个性、动机、环境等因素共同作用的结果。

此外，一个对某一领域只有适度知识的人可能比一个对该领域有广泛知识的人能够提出更有创造性的解决方案。

最有创造力的人喜欢用他们自己选择的新颖的方式来思考，并且能够区分重要的问题和不重要的问题。

对创造力最重要的人格特质包括自我效能感、对模糊性的容忍、愿意克服障碍和承担合理的风险。

内在动机也被证明对创造力非常重要。

然而，创新不仅仅是产生想法。

它是将这些想法应用到一些新的设备或过程中。

证据表明，并非所有的发明家都是创新者。

事实上，许多想法都被留在了绘图板上，也就是说，在发明者的车库里。

将想法转化为新产品或新过程所必需的创业技能与产生原始想法的技能和思维方向非常不同。

一个发明家通常会有内向的倾向，这可能使他们很难向别人传达自己的想法。

正如我们在赛格威案例中看到的，该公司解决了合并这两套技能的需要，以实现创新，通过组建团队，在确认发现所有这些技能在一个人的想法和执行人员的混合。

3. **Could firms identify people with greater capacity for creativity or inventiveness in their hiring procedures?**

公司能否在招聘程序中识别出具有更强创造力和发明能力的人?

Individuals can be tested for factors indicative of creativity such as intrinsic motivation, intellectual abilities, knowledge, style of thinking, and personality traits. Of course these types of tests are no guarantee of performance in the job. Firms hiring for creative jobs are likely to find their best information comes from an individual work history especially if that history includes activity that can be characterized as entrepreneurial.

个人可以测试创造力的指示因素，如内在动机、智力、知识、思维方式和个性特征。当然，这些类型的测试并不能保证在工作中的表现。招聘创造性工作的公司很可能会发现他们最好的信息来自于个人的工作经历，特别是如果这个经历包含了具有创业精神的活动。

4. **To what degree do you think the creativity of the firm is a function of the creativity of individuals, versus the structure, routines, incentives, and culture of the firm? Can you give an example of a firm that does a particularly good job at nurturing and leveraging**

the creativity of its individuals?
相对于公司的结构、惯例、激励和文化，你认为公司的创造力在多大程度上是个人创造力的一种功能？你能举一个在培养和利用员工创造力方面做得特别好的公司的例子吗？

Students should be encouraged to debate the role of innate individual creativity versus the firm structure, routines, incentives and culture that can nurture or thwart such creativity. Many students will volunteer companies such as 3M (well-known for its practice of permitting "bootlegging"), Apple (which encouraged a rebellious and free-thinking culture) or companies from their own experience as examples of companies that do a good job of nurturing and leveraging creativity.
应该鼓励学生就先天的个人创造力与可能培养或阻碍这种创造力的企业结构、惯例、激励和文化的作用进行辩论。许多学生将志愿服务于3M(以允许"盗版"而闻名)、苹果(鼓励一种叛逆和自由思维的文化)等公司，或者以自己的经验作为培养和利用创造力的典范的公司。

5. **Several studies indicate that the use of collaborative research agreements is increasing around the world. What might be some of the reasons that collaborative research is becoming more prevalent?**
几项研究表明，全世界使用合作研究协议的情况正在增加。合作研究变得越来越普遍的一些原因是什么？

The increasing prevalence of collaborative research agreements can be attributed to several factors. First, there is an increased awareness of the benefits of knowledge sharing. When individuals or firms participate in innovation networks, formal or informal, they are exposed to new information and ideas. Greater knowledge leads to the identification of more recombination opportunities. The network can also bring to bear knowledge regarding which of these re-combinations is most likely to become a new product or process. Second, rapid advances in information technology have greatly facilitated collaboration by reducing the cost (and increasing the pace) that information can be transmitted. Email, video conferencing, groupware programs, etc. all enable organizations to collaborate much more effectively and efficiently than in the past. Information technology has also reduced the search costs of locating a suitable collaboration partner, as well as the monitoring costs of ensuring that partner behaves as agreed. Third, as the pace of innovation has quickened (as discussed in chapter 1), firms have needed to obtain capabilities and resources for innovation more quickly than before; collaboration provides a way to rapidly gain access to other organizations knowledge and resources, enabling the organizations to collectively bring innovations to market faster than any individual organization could alone.
合作研究协议的日益流行可以归因于几个因素。
首先，人们越来越意识到知识共享的好处。
当个人或公司正式或非正式地参与创新网络时，他们会接触到新的信息和想法。
更大的知识导致识别更多的重组机会。
该网络还可以带来有关哪些重组最有可能成为新产品或新工艺的知识。
其次，信息技术的迅速发展降低了信息传播的成本(并加快了传播速度)，极大地促进了合作。
电子邮件、视频会议、群件程序等都能使组织比过去更有效地协作。
信息技术还降低了查找合适协作伙伴的搜索成本，以及确保合作伙伴按约定行为的监视成本。
第三，随着创新步伐的加快(如第1章所述)，企业需要比以前更快地获取创新能力和资源;
协作提供了一种快速获取其他组织知识和资源的途径，使组织能够比任何单独的组织更快地将创新集体带入市场。

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Chapter 3

1. What are some reasons that established firms might resist adopting a new technology?

现有的公司可能会拒绝采用新技术的原因是什么?

Early on the decision not to invest in a new technology can be financially justified (on the surface) by the lower returns to effort earned by investing in a new technology and the large investments already made in the incumbent technology. The reasons that play the largest role in deterring a firm from investing in a new technology have less to do with the financial factors and more to do with the nature of a firm's capabilities and the type of knowledge underlying the new technology. Firms will not adopt or delay adoption of a new technology because:

1) Their focus on improving the processes supporting the current technology has decreased their ability to identify and respond to a technological discontinuity. In other words, the firm may not know what hit them. Not that the focus on improving current processes has to result in a lack of focus on new architectures. It is however a general tendency for firms to decrease or cease to invest in the search for new architectures when they have a currently successful technology.

2) The complexity of the knowledge underlying new technologies is also part of the answer, particularly if the knowledge needed is tacit in nature. Acquiring tacit knowledge often requires learning from another person directly which can be both time consuming and costly.

3) In addition, the degree to which firms must develop new complementary resources also plays a role. If firms must make large investments in time, money, or both, in the complementary resources needed to utilize a new technology successfully adoption can be delayed.

4) It may also be the case that firms, like individuals, also have traits that lead them to be innovators, early adopters, laggards, etc.

早期不投资新技术的决定在经济上(表面上)是合理的，因为投资新技术所获得的回报较低，而在现有技术上已经进行了大量投资。

阻碍公司对新技术投资的最主要原因与财务因素关系不大，而更多地与公司能力的性质和新技术背后的知识类型有关。

企业不会采用或延迟采用一项新技术，因为:

1)他们对改进支持当前技术的过程的关注降低了他们识别和应对技术中断的能力。

换句话说，公司可能不知道是什么打击了他们。

对改进当前流程的关注并不会导致对新架构的关注不足。

然而，当公司拥有一项目前成功的技术时，通常倾向于减少或停止在寻找新架构方面的投资。

2)作为新技术基础的知识的复杂性也是部分原因，特别是如果所需要的知识本质上是隐性的。

隐性知识的获取通常需要直接向他人学习，这既费时又昂贵。

3)此外，企业必须开发新的互补资源的程度也起作用。

如果公司必须在时间、金钱或两者上进行大量投资，那么成功利用新技术所需的互补资源就会被推迟。

4)也有可能，公司和个人一样，也有一些特点使他们成为革新者、早期采用者、落后者等等。

2. Are well-established firms or new entrants more likely to a) develop and/or b) adopt new technologies? What are some reasons for your choice?

老牌企业还是新进入者更有可能a)发展和/或b)采用新技术?你选择的原因是什么?

Simply put, new firms do not have the "baggage" that incumbent firms have. They have not made any financial or learning investments in the incumbent technology. In addition they are most likely to be able to gain a sustainable competitive advantage by adopting the new technology. It is very unlikely that a new firm can catch up with an incumbent firm in terms of the quality and efficiency of production of the incumbent's technology given that the incumbent firm has had a much longer period of time to move down the learning curve.

简单地说，新公司没有现有公司的"包袱"。他们没有对现有技术进行任何财务或学习投资。此外，它们最有可能通过采用新技术而获得可持续的竞争优势。新公司不太可能在技术生产的质量和效率上赶上现有公司，因为现有公司有更长的时间来学习。

3. Think of an example of an innovation you have studied at work or school. How would you characterize it on the dimensions described at the beginning of the chapter?

Students will bring a wide variety of experience to answering this question. They should address all four of the following dimensions in their answer: product versus process innovation, radical versus incremental, competence enhancing versus competence destroying, and architectural versus component innovation.

学生们将会带来各种各样的经验来回答这个问题。在他们的回答中，他们应该解决以下四个方面:产品创新与过程创新，激进与增量创新，能力增强与能力破坏，以及架构创新与组件创新。

4. What are some reasons that both technology improvement and technology diffusion exhibit s-shaped curves?

The dynamics underlying the s-curve shape of technology performance improvement and rate of diffusion are related but also different. For example, improvements in a technology's performance are likely to translate into faster adoption rates. In both processes, performance improvement and diffusion, the initial phase is characterized by a poor understanding of the technology. In the case of technology improvement firms are just beginning to understand the technology and the processes needed to support it. In the case of diffusion, adopters vary in their degree of risk aversion and excitement over new products (e.g. laggards will wait until all the "bugs" have been worked out and the price has decreased to buy a new product). The second phase is characterized by a deeper understanding of the technology, both on the part of firms and consumers, resulting in rapid process improvements and adoption. Finally, the technology reaches its inherent technological limits which flattens out the performance improvement curve and on the diffusion front most consumers have either adopted the new product or never will.

技术性能改善与扩散率的s曲线形态的动力学是相关的，但又各不相同。

例如，技术性能的提高很可能转化为更快的采用率。

在性能改进和扩散这两个过程中，最初阶段的特点是对技术了解不足。

在技术改进的情况下，公司才刚刚开始了解技术和支持它所需的过程。

在扩散的情况下，采用者对新产品的风险厌恶程度和兴奋程度各不相同(例如，落后者会等到所有的错误都解决了，价格降低了才购买新产品)。

第二阶段的特点是公司和消费者对技术的更深层次的理解，从而导致快速的过程改进和采用。

最终，技术达到了其固有的技术极限，使性能改善曲线变得平坦，而在扩散前沿，大多数消费者要么已经接受了新产品，要么永远不会接受。

5. Why do technologies often improve faster than customer requirements? What are

the advantages and disadvantages to a firm of developing a technology beyond the current state of market needs?

为什么技术通常比客户需求改进得更快?一个公司开发一项超出当前市场需求的技术的优势和劣势是什么?

Industries identified in the text as improving their underlying technologies faster than customer requirements include microprocessors, software, motorcycles, and electric vehicles. The driving force appears to be in the market segmentation and pricing objectives of firms. Products in the higher tiers often have higher margins so firms attempt to shift the bulk of their sales into the higher tiers. On the consumer side, a customers' ability to fully utilize performance improvements is slowed by the need to learn how to use new features and adapt their work and lifestyles.

文中指出，微处理器、软件、摩托车和电动汽车等行业的基础技术改进速度快于客户要求。推动因素似乎是企业的市场细分和定价目标。在较高层次的产品通常有较高的利润，所以公司试图把他们的大部分销售转移到较高层次。在消费者方面，由于需要学习如何使用新特性以及适应他们的工作和生活方式，客户充分利用性能改进的能力会变慢。

6. In what industries would you expect to see particularly short technology cycles? In what industries would you expect to see particularly long technology cycles? What might be some of the factors that influence the length of technology cycles in an industry?

你认为哪些行业的技术周期会特别短?你认为哪些行业的技术周期会特别长?哪些因素可能会影响一个行业的技术周期?

Students are likely to come up with a variety of answers to this question; some of the more likely might revolve around factors such as fixed costs, competitive rivalry, the degree of interdependency between the technology and multiple stakeholders, and the type of knowledge underlying the technology. For example, in industries with very high fixed costs of either development or production (e.g., commercial aircraft manufacturing), firms require longer periods to amortize the cost of their investment in a particular generation of technology. Rapid change may not be financially feasible. On the other hand, in industries that have relatively low development or production costs (e.g., software), lifecycles are often very short. There is very little fixed capital investment tying competitors to a particular generation of technology. Competition may also play a role; in industries with low entry barriers there may be much greater entry and turnover, enabling new entrants to usher in new technological generations at a more rapid pace. Finally, in some industries it is very hard to replace an existing technological generation because there is a complex web of stakeholders involved, making it difficult to negotiate a solution that everyone finds amenable. For example, introducing hydrogen-powered automobiles requires cooperation by auto makers, fuel producers, fuel distributors, customers, and government, and many of these stakeholders have different incentives making it difficult to come to consensus. In such a situation, a technology can have great inertia.

The type of knowledge underlying the technology and the complementary competencies required to adopt an innovation can either shorten or lengthen a technology's cycle. If the technology is easy to learn and most firms already have the complementary competencies then the technology cycle will be short. If the knowledge underlying the technology is complex and/or tact the technology cycle will be longer.

对于这个问题，学生们可能会有各种各样的答案;

其中一些更有可能围绕固定成本、竞争对手、技术和多个利益相关者之间的相互依赖程度，以及技术背后的知识类型等因素。

例如，在开发或生产的固定成本非常高的行业(如商用飞机制造)，企业需要较长时间来摊销其在某一代技术上的投资成本。

快速变革在经济上可能不可行。

另一方面，在开发或生产成本相对较低的行业(例如，软件)，生命周期通常非常短。

几乎没有固定资本投资将竞争对手与某一代技术联系起来。
竞争也可能起作用;
在进入壁垒较低的行业，可能会有更大的进入和更替，使新进入者能够以更快的速度引进新技术一代。
最后，在一些行业，很难替换现有的技术一代，因为涉及到复杂的利益相关者网络，这使得很难协商出一个人人都能接受的解决方案。
例如，引入氢动力汽车需要汽车制造商、燃料生产商、燃料分销商、客户和政府的合作，而这些利益相关者有不同的动机，因此很难达成共识。
在这种情况下，一项技术可能会有很大的惰性。
技术背后的知识类型和采用创新所需的互补能力可以缩短或延长技术的周期。
如果技术很容易学习，而且大多数公司已经具备互补的能力，那么技术周期将会很短。
如果技术背后的知识是复杂和/或老练的，技术周期将会更长。

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Chapter 4

1. **What are some of the sources of increasing returns to adoption（采纳）?**

   A self-reinforcing cycle begins when increases in the adoption of a technology:
   - **a.** leads to greater knowledge accumulation, that supports the making of improvements in the technology's performance,
   - **b.** increases the value of the technology for the consumer because they can more readily interact with others if everyone is using the same technology (compatibility), and
   - **c.** increases the likelihood that developers of complementary assets will focus on one technology over its alternatives.

   当一种技术的采用增加时，一个自我强化的循环就开始了:

   - 导致更大的知识积累，从而支持技术性能的改进，
   - 增加了技术对消费者的价值，因为如果每个人都使用相同的技术，他们可以更容易地与他人交互(兼容性)
   - 增加了互补资产的开发人员专注于一种技术而不是它的替代技术的可能性。

2. **What are some examples of industries not mentioned in the chapter that demonstrate increasing returns to adoption?**

   Additional industries demonstrating increasing returns to adoption are typewriters with the Qwerty keyboard and the adoption of VHS over Beta. The standard keyboard on a typewriter was initially designed to slow typists down because otherwise the machine would jam. Today jamming is not a problem but typists who have put in the effort to learn Qwerty do not want to invest more time to learn a new keyboard. The battle between VHS and Beta is a good example of how the development of complementary goods (players/recorders) played a large role in the establishment of a dominant design. Students may also point out that instant messaging software exhibits strong network externalities, as does short messaging services on cellular phones.

   其他行业的回报也在增加，比如使用Qwerty键盘的打字机和使用VHS而不是Beta。
   打字机上的标准键盘最初设计是为了减慢打字员的速度，否则机器就会卡住。
   今天，干扰不是一个问题，但打字员谁投入了努力学习Qwerty不愿意投入更多的时间学习一个新的键盘。
   VHS和Beta之间的争斗是一个很好的例子，说明互补商品(玩家/录音机)的开发在主导设计的建立中扮演了很大的角色。
   学生们可能还指出，即时通讯软件表现出很强的网络外部性，手机上的短消息服务也是如此。

3. **What are some of the ways a firm can try to increase the overall value of its technology, and its likelihood of becoming the dominant design?**

   Firms can increase the likelihood that their technology will become the dominant design by:

   a. increasing the technologies' standalone value to the customer (e.g. superior functionality at a competitive cost),

b. increasing the technologies' network externalities value by

a) encouraging developers of complementary assets to create products for their technologies,
b) advertising heavily to create a perception that the installed base is larger than it is or that a new product with superior capabilities will be launched soon (so that consumers do not buy a product already available),
c) leveraging an incumbent technology's complementary assets and installed base by making their technology compatible with the incumbent technology.

企业可以通过以下方式增加其技术成为主导设计的可能性:a.增加技术对客户的独立价值(例如以具有竞争力的成本获得卓越的功能);b.通过以下方式增加技术网络的外部性价值

a)鼓励互补资产的开发人员为其技术创造产品;

b)大量做广告，以制造一种错觉，让人觉得已安装的用户群比实际规模大，或者一款性能优越的新产品即将推出(这样消费者就不会购买现有的产品);

c)通过使现有技术与现有技术兼容，利用现有技术的互补资产和安装基础。

4. **What determines whether an industry is likely to have one or a few dominant designs?**
Whether an industry will have one dominant design or a few is a function of the following:
    i. The level of market share at which consumers get their network externality needs met. If consumers network externality needs are met at low levels of market share then more than one dominant design may develop.
    ii. Path dependency can affect the trajectory of technology development that in turn affects the number of dominant designs.
    iii. Success of early entrants can prevent challengers from gaining a foothold in the market.
    iv. Sponsorship of a technology by a powerful firm can help the technology attain a controlling share of the market that locks out alternative technologies.
    v. Whether a government intervenes to ensure that technologies are compatible so that societal benefits are attained.

一个行业的主导设计是一种还是几种，取决于以下几个方面:

a. 消费者获得网络外部性需求满足的市场份额水平。如果消费者的网络外部性需求在低水平的市场份额得到满足，那么可能会开发出一种以上的主导设计。

b. 路径依赖会影响技术发展的轨迹，进而影响主导设计的数量。

c. 早期进入者的成功可以阻止挑战者在市场中获得立足点。

d. 由实力雄厚的公司赞助一项技术，可帮助该技术获得市场的控制份额，从而将替代技术拒之门外。

e. 政府是否进行干预，以确保技术兼容，从而实现社会效益。

5. **Are dominant designs good for consumers? Competitors? Complementors? Suppliers?**
With regard to consumers this question can be rephrased as: Are winner-take-all markets good for consumers? The answer is yes if the benefits accrued by consumers through widespread adoption of a technology outweighs the costs associated with a monopoly (e.g. higher prices, less product, variety, etc.). Of course the answer is no if the benefits accrued

do not outweigh the costs.

对于消费者来说，这个问题可以换一种说法:赢者通吃的市场对消费者有利吗?答案是肯定的，如果消费者通过广泛采用一种技术所获得的利益超过了与垄断相关的成本(例如价格更高、产品更少、品种更少等)。当然，如果累积的收益不超过成本，答案是否定的。

With regard to competitors the answer is no unless the technology is “open” (not protected by intellectual property rights) or your firm is the owner of the technology that becomes the dominant design. Firms that do not have their technology adopted lose their investment in their technology and also have to play catch up in order to compete with the firm that owns the dominant design. The firm that owns the technology that becomes the dominant design benefits from high returns and their ability to affect the technologies development trajectory further supporting their dominant position in the industry.

至于竞争对手，答案是否定的，除非技术是开放的(不受知识产权保护)，或者你的公司拥有成为主导设计的技术。
那些没有采用他们的技术的公司失去了他们在技术上的投资，同时也不得不追赶以与拥有主导设计的公司竞争。
拥有技术成为主导设计的企业将获得高回报，并有能力影响技术发展轨迹，进一步支撑其在行业中的主导地位。

With regard to complementors and suppliers the establishment of a single dominant design is likely to reduce their power as suppliers, but also reduces the market uncertainty they face and the eliminates the cost of trying to support multiple competing technologies. Complementors often require support from the firm that owns the technology (such as the releasing of computer code). Complementors can benefit from the establishment of a dominant design by not wasting resources developing for other platforms that do not thrive and from an expanded market for their products. Other suppliers could have pricing power reduced unless they themselves are a monopoly.

关于补充者和供应者，建立单一的主导设计可能会减少它们作为供应者的力量，但也会减少它们面临的市场不确定性，并消除试图支助多种竞争技术的成本。
互补通常需要拥有技术的公司的支持(比如计算机代码的发布)。
互补者可以从主导设计的建立中获益，而不用浪费资源去开发其他无法繁荣发展的平台，也可以从扩大的产品市场中获益。
其他供应商的定价权可能会降低，除非它们自己是垄断者。