# 科技英语阅读与翻译教程

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ENGLISH READING AND
TRANSLATION FOR
SCIENCE AND TECHNOLOGY

大连海事大学出版社
DALIAN MARITIME UNIVERSITY PRESS

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# 前　　言

　　《科技英语阅读与翻译教程》以英语为载体,以科技领域文章为依托,介绍对人类产生重要影响的科学技术,诠释科技文明。本教程使学生在获取科技知识的基础上习得英语,拓宽科学视野和思路,扩大科技英语词汇及文体特征等系统知识量,提高综合应用科技英语的能力,满足我国日益增长的科技发展和国际交流与合作的需要。本教程是融科学性、可读性和实用性于一体的英语教材。

　　本教程包括信息技术、生命科学技术、交通运输技术、环境科学技术、新能源技术、材料科学技术等6章,共18个单元,每个单元包括A、B两篇课文及词汇、短语、术语、专有名词、翻译及解析、练习和趣味短文等部分。教材内容新颖,跟踪科技最新发展,保持与源语一定的关联性,图文并茂,适用于普通高等院校MTI课程教学、英语专业阅读或翻译拓展课程相关课程教学。

　　本教程主要特点:(1)着眼科技,内容丰富。课文均选编于近年来英语国家出版的科技领域教科书、科普知识网站和国内英语期刊上选载的科技英语读物,知识内容兼具实效性、普适性和专业性。(2)主题鲜明,实用性强。课文用词严谨,语言规范,突出科技英语的语言特点,追求地道的科技英语表达。(3)内容依托,特色突出。本教程以特色的科技主题文章为依托,有利于激发学生英语学习的积极性,使学生在学习文章内容的过程中习得语言。(4)侧重阅读与翻译。本教程的阅读与翻译内容涉及科技领域的六大方面,内容丰富,实用性强。

　　本教程有利于提高学生英语语言综合应用能力,尤其是阅读和翻译能力,使学生在了解科技知识的过程中习得语言,是我国高校教育工作者内容依托教学的适用教材,也是英语专业及科技类专业本科生及研究生必要的参考书。本教程对培养适合21世纪需要的兼顾科技知识和英语应用能力的复合应用型人才具有重要意义。

编　者
2017 年 7 月

# Contents

# Chapter 1

# *Information Technology*
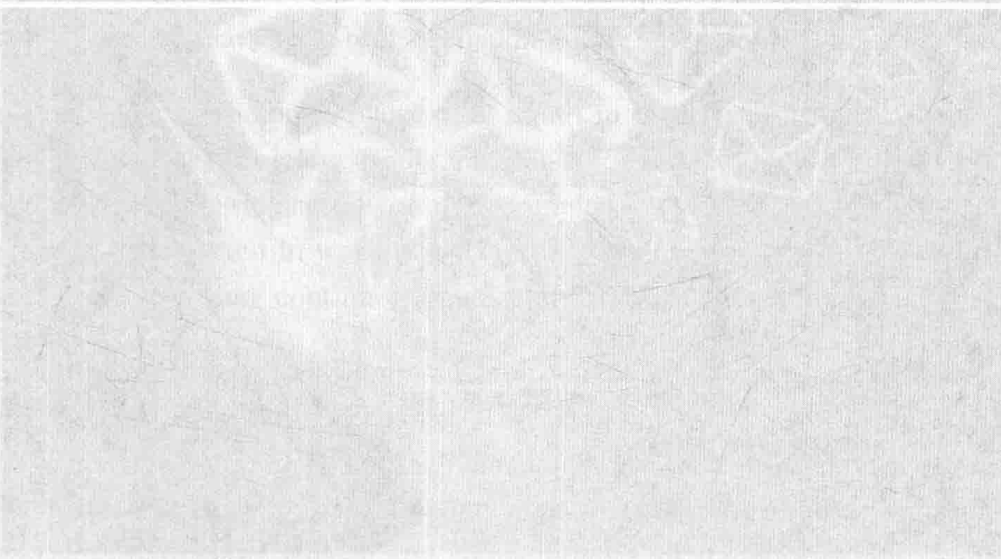
# Unit 1
## Communication Technology

### The Communication Technology Ecosystem

## Pre-reading

- 1. To know the significance of studying communication technology.
- 2. To identify individual characteristic of communication technology.

# TEXT

1.  Communication technologies are the nervous system of contemporary society, **transmitting** and distributing sensory and control information and interconnecting a myriad of interdependent units. These technologies are critical to commerce, essential to entertainment, and **intertwined** in our interpersonal relationships. Because these technologies are so vitally important, any change in communication technologies has the potential to impact **virtually** every area of society.

2.  One of the **hallmarks** of the industrial revolution was the introduction of new communication technologies as **mechanisms** of control that played an important role in almost every area of the production and distribution of manufactured goods. These communication technologies have evolved throughout the past two centuries at an increasingly rapid rate. This evolution shows no signs of slowing, so an understanding of this evolution is vital for any individual wishing to attain or **retain** a position in business, government, or education.

3.  The economic and political challenges faced by the United States and other countries since the beginning of the new **millennium** clearly illustrate the central role these communication systems play in our society. Just as the **prosperity** of the 1990s was credited to advances in technology, the economic challenges that followed were linked as well to a major **downturn** in the technology sector. Today, communication technology is seen by many as a tool for making more efficient use of energy sources.

4.  Communication technologies play as big a part in our private lives as they do in commerce and control in society. Geographic distances are no longer **barriers** to relationships thanks to the bridging power of communication technologies. We can also be entertained and **informed** in ways that were unimaginable a century ago thanks to these technologies—and they continue to evolve and change before our eyes.

5.  The most obvious aspect of communication technology is the hardware—the physical equipment related to the technology. The hardware is the most **tangible** part of a technology system, and new technologies typically spring from developments in hardware. However, understanding communication technology requires more than just studying the hardware. One of the characteristics of today's digital technologies is that most are based upon computer technology, requiring instructions and **algorithms** more commonly known as software.

6. In addition to understanding the hardware and software of the technology, it is just as important to understand the content communicated through the technology system. Some consider the content as another type of software. Regardless of the terminology used, it is critical to understand that digital technologies require a set of instructions as well as the equipment and content.

7. The hardware, software, and content must also be studied within a larger context. Rogers' definition of communication technology includes some of these contextual factors, defining it as the hardware equipment, organizational structures, and social values by which individuals collect, process, and exchange information with other individuals. An even broader range of factors is suggested by Ball-Rokeach in her media system dependency theory, which suggests that communication media can be understood by analyzing dependency relations within and across levels of analysis, including the individual, organizational, and system levels. Within the system level, Ball-Rokeach identifies three systems for analysis: the media system, the political system, and the economic system.

8. These two approaches have been **synthesized** into the "Technology Ecosystem". The core of the technology ecosystem consists of the hardware, software, and content. Surrounding this core is the organizational **infrastructure**: the group of organizations involved in the production and distribution of the technology. The next level moving outwards is the system level, including the political, economic, and media systems, as well as other groups of individuals or organizations serving a common set of functions in society. Finally, the individual users of the technology cut across all of the other areas, providing a focus for understanding each one. The basic **premise** of the technology ecosystem is that all areas of the ecosystem interact and must be examined in order to understand a technology.

9. Adding another layer of complexity to each of the areas of the technology ecosystem is also helpful. In order to identify the impact that each individual characteristic of a technology has, the factors within each area of the ecosystem may be identified as "enabling", "limiting", "motivating", and "inhibiting", depending upon the role they play in the technology's **diffusion**.

10. Enabling factors are those that make an application possible. For example, the fact that the **coaxial** cable used to deliver traditional cable television can carry dozens of channels is an enabling factor at the hardware level. Similarly, the decision of policy makers to **allocate** a portion of the **spectrum** for cellular telephony is an enabling factor at the system level (political system). One starting point to use in examining any technology is to make a list of the underlying factors from each area of the tech-

nology ecosystem that make the technology possible in the first place.

11. Limiting factors are the opposite of enabling factors; they are those factors that create barriers to the adoption or impacts of a technology. A great example is related to the cable television illustration above. Although coaxial cable increased the number of television programs that could be delivered to a home, most analog coaxial networks cannot transmit more than 100 channels of programming. To the viewer, 100 channels may seem to be more than is needed, but to the programmer of a new cable television channel unable to get space on a filled-up cable system, this hardware factor represents a definite limitation. Similarly, the fact that the policy makers discussed above initially permitted only two companies to offer cellular telephone service in each market was a system-level limitation on that technology. Again, it is useful to apply the technology ecosystem to create a list of factors that limit the adoption, use, or impacts of any specific communication technology.

12. Motivating factors are a little more **complicated**. They are those factors that provide a reason for the adoption of a technology. Technologies are not adopted just because they exist. Rather, individuals, organizations, and social systems must have a reason to take advantage of a technology. The desire of local telephone companies for increased profits, combined with the fact that growth in providing local telephone service is limited, is an organizational factor motivating the telcos to enter the markets for new communication technologies. Individual users desiring information more quickly can be motivated to adopt electronic information technologies. If a technology does not have **sufficient** motivating factors for its use, it cannot be a success.

13. Inhibiting factors are the opposite of motivating ones, providing a **disincentive** for adoption or use of a communication technology. An example of an inhibiting factor at the content level might be a new electronic information technology that has the capability to update information more quickly than existing technologies, but provides only "old" content that consumers have already received from other sources. One of the most important inhibiting factors for most new technologies is the cost to individual users. Each potential user must decide whether the cost is worth the service, considering his or her **budget** and the number of competing technologies. Competition from other technologies is one of the biggest barriers any new technology faces. Any factor that works against the success of a technology can be considered an inhibiting factor. As you might guess, there are usually more inhibiting factors for most technologies than motivating ones. And if the motivating factors are more **numerous** and stronger than the inhibiting factors, it is an easy bet that a technology will be a success.

14. All four factors—enabling, limiting, motivating, and inhibiting—can be identified at the system, organizational, content, and individual user levels. However, hardware and software can only be enabling or limiting; by themselves, hardware and software do not provide any motivating factors. The motivating factors must always come from the messages transmitted or one of the other areas of the ecosystem.

15. The final **dimension** of the technology ecosystem relates to the environment within which communication technologies are introduced and operate. These factors can be termed "external" factors, while ones relating to the technology itself are "internal" factors. In order to understand a communication technology or be able to predict the manner in which a technology will diffuse, both internal and external factors must be studied and compared. (1385 words)

## ➤ **New Words**

| | | |
|---|---|---|
| transmit [trænz'mɪt] | v. | send an electronic signal, radio or television broadcast, etc. 传送;输送;发射 |
| intertwine [ˌɪntə'twaɪn] | v. | be or become very closely connected with sb/sth else 紧密相连 |
| virtually ['vɜːtʃʊəlɪ] | ad. | almost or very nearly, so that any slight difference is not important 几乎;差不多;事实上 |
| hallmark ['hɔːlmɑːk] | n. | a feature or quality that is typical of sb/sth 特征;特点 |
| mechanism ['mek(ə)nɪz(ə)m] | n. | a system of parts in a living thing that together perform a particular function 机制;构造 |
| retain [rɪ'teɪn] | v. | keep sth; continue to have sth 保持;持有;保留 |
| millennium [mɪ'lenɪəm] | n. | a period of 1,000 years, especially as calculated before or after the birth of Christ 一千年,千年期(尤指公元纪年) |
| prosperity [prɒ'sperɪtɪ] | n. | the state of being successful, especially in making money 繁荣;兴旺;昌盛 |
| downturn ['daʊntɜːn] | n. | a fall in the amount of business that is done; a time when the economy becomes weaker (商业经济的)衰退,下降,衰退期 |
| barrier ['bærɪə] | n. | a problem, rule or situation that prevents sb from doing sth, or that makes sth impossible 障碍;阻力 |
| informed [ɪn'fɔːmd] | a. | having or showing a lot of knowledge about a particular subject or situation 有学问的;有见识的 |
| tangible ['tæn(d)ʒɪb(ə)l] | a. | that can be clearly seen to exist 有形的;实际的;真实的 |
| algorithm ['ælgərɪð(ə)m] | n. | (especially *computing*) a set of rules that must be followed when solving a particular problem 算法;计算 |

程序

| synthesize [ˈsɪnθəsaɪz] | *v.* combine separate ideas, beliefs, styles, etc. 综合 |
| infrastructure [ˈɪnfrəstrʌktʃə] | *n.* the basic systems and services that are necessary for a country or an organization to run smoothly（国家或机构的）基础设施,基础建设 |
| premise [ˈpremɪs] | *n.* a statement or an idea that forms the basis for a reasonable line of argument 前提;假定 |
| diffusion [dɪˈfjuːʒ(ə)n] | *n.* spreading sth or becoming spread widely in all directions 传播;普及;扩散 |
| coaxial [kəʊˈæksɪəl] | *a.* having or being mounted on a common axis 同轴的;共轴的 |
| allocate [ˈæləkeɪt] | *v.* give sth officially to sb/sth for a particular purpose 分配 |
| spectrum [ˈspektrəm] | *n.* a complete or wide range of related qualities, ideas, etc. 范围;各层次;幅度 |
| complicated [ˈkɒmplɪkeɪtɪd] | *a.* made of many different things or parts that are connected; difficult to understand 复杂的;难懂的 |
| sufficient [səˈfɪʃ(ə)nt] | *a.* enough for a particular purpose; as much as you need 足够的;充足的 |
| disincentive [ˌdɪsɪnˈsentɪv] | *n.* a thing that makes sb less willing to do sth 起抑制作用的事物;遏制因素 |
| budget [ˈbʌdʒɪt] | *n.* the money that is available to a person or an organization and a plan of how it will be spent over a period of time 预算 |
| numerous [ˈnjuːm(ə)rəs] | *a.* (*formal*) existing in large numbers 众多的;许多的 |
| dimension [dɪˈmenʃ(ə)n] | *n.* an aspect, or way of looking at or thinking about sth 方面;侧面 |

## ➤ *Phrases and Expressions*

a myriad of 大量的;无数的
be critical to 对……至关重要的
be credited to 认为是……的功劳;把……归于
spring from 起源于;由……引起
regardless of 不顾;不管
cut across 影响;符合;适用于(分离的不同群体)
be identified as 被认为是
relate to 涉及;与……相关
combine with 与……相结合
work against 违背;对……不利

## ➤ *Terminology*

digital technology 数字技术

media system dependency theory 媒介系统依赖论

coaxial cable 同轴电缆

cellular telephony 移动电话

cable television channel 有线电视频道

## ➤ *Proper Name*

Ball-Rokeach 鲍尔 – 洛基奇（人名）

## ➤ *Translation*

1. Communication technologies are the nervous system of contemporary society, transmitting and distributing sensory and control information and interconnecting a myriad of interdependent units. (Para. 1)

    通信技术是当代社会的神经系统，传播和分布感官及控制信息，并连接大量相互依存的单元。

2. One of the hallmarks of the industrial revolution was the introduction of new communication technologies as mechanisms of control that played an important role in almost every area of the production and distribution of manufactured goods. (Para. 2)

    工业革命的一个特征是对作为控制机制的新型通信技术的引入，这一机制几乎在制造商品的生产和分配中的每个领域都发挥了重要的作用。

3. This evolution shows no signs of slowing, so an understanding of this evolution is vital for any individual wishing to attain or retain a position in business, government, or education. (Para. 2)

    这一演变没有任何减缓的迹象，因此了解这一演变对任何希望获得或是保留企业、政府或学校职位的个体而言是至关重要的。

4. The economic and political challenges faced by the United States and other countries since the beginning of the new millennium clearly illustrate the central role these communication systems play in our society. (Para. 3)

    从新千年开始，美国和其他国家面临的经济和政治挑战清晰地阐明了这些通信系统在我们社会中发挥的核心作用。

5. Just as the prosperity of the 1990s was credited to advances in technology, the economic challenges that followed were linked as well to a major downturn in the technology sector. (Para. 3)

    正如将 20 世纪 90 年代的繁荣归因于技术的进步一样，随之而来的经济挑战同样与技术方

面的较大下滑有关。

6. Geographic distances are no longer barriers to relationships thanks to the bridging power of communication technologies. （Para. 4）

由于通信技术的衔接力量,地理距离不再是建立关系的障碍。

注:该句翻译中需要注意翻译名词 relationship 时使用增词法,构成动宾搭配,以符合中文的表达习惯。

7. One of the characteristics of today's digital technologies is that most are based upon computer technology, requiring instructions and algorithms more commonly known as software. （Para. 5）

当今数字技术的一个特征是大部分基于计算机技术,需要指令以及通常被称为软件的计算程序。

8. An even broader range of factors is suggested by Ball-Rokeach in her media system dependency theory, which suggests that communication media can be understood by analyzing dependency relations within and across levels of analysis, including the individual, organizational, and system levels. （Para. 7）

更为广泛的因素是由鲍尔 – 洛基奇在其媒介系统依赖论中提出的,这意味着人们能够通过包含个体的、组织的以及系统的内外层次来分析依赖关系,从而理解通信媒介。

注:该句含有两个被动句和一个非限定性定语从句。英语的被动式译成汉语时,若不便采用"被动式",常常采用"是(由)……的"式或"……加以/予以"式。而非限定性定语从句才采用"……这是/意味着"的翻译句式。

9. The basic premise of the technology ecosystem is that all areas of the ecosystem interact and must be examined in order to understand a technology. （Para. 8）

通信技术生态系统的基本前提是生态系统的所有领域是互相影响的。为了了解一项技术,必须要对所有领域进行检测。

10. In order to identify the impact that each individual characteristic of a technology has, the factors within each area of the ecosystem may be identified as "enabling", "limiting", "motivating", and "inhibiting", depending upon the role they play in the technology's diffusion. （Para. 9）

为了识别每一项技术的个体特征所具有的影响,技术生态系统每一区域内的因素依据它们在技术传播方面发挥的作用,分别被识别为使能因素、限制因素、激发因素和抑制因素。

11. One starting point to use in examining any technology is to make a list of the underlying factors from each area of the technology ecosystem that make the technology possible in the first place. （Para. 10）

检测任何技术的一个起点是要从技术生态系统的每一个区域列出最初使得该技术可行的潜在因素。

12. The desire of local telephone companies for increased profits, combined with the fact that growth in providing local telephone service is limited, is an organizational factor motivating

the telcos to enter the markets for new communication technologies. （Para. 12）

结合提供地方电话服务的增长是有限的这一事实,地方电话公司对增加利润的欲望成为一个激发电话公司进入市场获取新的通信技术的组织因素。

13. And if the motivating factors are more numerous and stronger than the inhibiting factors, it is an easy bet that a technology will be a success. （Para. 13）

如果激发因素比抑制因素更多、更强的话,那么一项技术取得成功就是一件很容易的事情了。

注:该句是一个主从复合句,其中主句是一个主语从句,在翻译时需要调整语序,先翻译真正主语部分,后翻译形式主语部分,以符合中文的表达习惯。

14. In order to understand a communication technology or be able to predict the manner in which a technology will diffuse, both internal and external factors must be studied and compared. （Para. 15）

为了了解一种通信技术或能够预测一种技术传播的方式,内因和外因都必须进行研究和比较。

注:该句后半部分含有被动句,在翻译过程中要符合中文的表达习惯,可以合理地避开使用被动翻译句,以使句子前后连贯、便于衔接。

# Exercises

## 1. Translate the following sentences based on the information.

| transmit | intertwine | virtually | hallmark |
|---|---|---|---|
| downturn | tangible | barrier | allocate |
| diffuse | premise | disincentive | spectrum |
| be credited to | spring from | relate to | combined with |

1) Today, VOA broadcasts to satellites in space that send the signal back to stations on the ground that _____ programs with a clear signal.

2) Police said the explosion bore all the _____ of a terrorist attack.

3) In 2003, African leaders pledged to _____ 10 percent of their budgets to agriculture by 2008, but the United Nations says only eight countries have implemented that promise.

4) One intriguing new study suggests that lying may _____ a completely different part of the brain in children compared with adults.

5) Some people experience shyness as a _____ to communication, but this can be broken down gradually.

6) His reasoning is based on the _____ that all people are equally capable of good and evil.

7) Much of the present enthusiasm for Jane Austen can _____ a 70-year-old screenwriter