



Distribution of Media and Information

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12.1 Introduction

What was the world's largest private company in the eighteenth century? As mentioned in ► Chap. 2 The Information Economy, it was the Thurn und Taxis postal firm, which ran the postal monopoly in the Habsburg territories of Central and South-Eastern Europe. And in the late nineteenth century? Western Union, with its telegraph monopoly in the USA. Similarly, for most of the twentieth century, the telecom company AT&T was the world's largest business firm, with almost 2 million employees.

What are the common elements? All of these companies were distribution networks for information. It seems that this activity, through several centuries, has been large in scope, important, and profitable.

This chapter will therefore discuss the role of distribution as a central activity in the information sector, with its especially rapid technological innovation and change. The chapter is part of a section that covers four major business functionalities that link a product with a consumer: demand research, marketing, pricing, and distribution.

We will cover in this chapter:

- The architectures of distribution networks.
- The economics and analytical tools of distribution.
- Wholesale and retail distribution and their trends.
- The impact of distribution on content.

At the end of this chapter, you will have an added understanding of the subject and managerial prowess to operate this function or to collaborate with it. This will be useful in many endeavors. There are few examples of a company or non-profit organization whose products and services do not require some form of distribution to users or other producers.

12.1.1 The Definition of “Distribution”

First, let us define the term. Distribution must be distinguished from marketing, logistics, or packaging. Distribution is concerned with moving the product or service to the customer, while marketing deals with developing a market for a product. Logistics is the management of the flow of products and inputs in support of distribution. Packaging, such as the assembly of content by a cable channel, TV network, or music label, is the creation of a branded steady flow of media product. That content package is then distributed.

12.1.2 The Myths of Media Distribution

The three legs of media are distribution, content, and technology devices. Within media firms, the distribution function is usually considered less prestigious than content production, yet it is an essential skill in an environment of glut, globalization, and multiple platforms. Indeed, we will end up concluding that it is effective distribution that gives a media firm the

edge over its competitors. To reach that conclusion requires an analysis of several prevailing myths.

12.1.2.1 Myth #1: “Content Is King”

“Content is king” is a cliché in the media sector. It is based on the belief that content is scarce and difficult to produce, while distribution is a fairly pedestrian logistics operation and business activity. But is it possible that in actuality “distribution is king”? The relative power of the elements in a value chain is based on the relative scarcity prevailing at that stage and the market power of its providers. We will observe that distribution, given its fundamental economics, is typically conducted in much more concentrated markets by very large firms, compared with content production, which has much lower entry barriers and is not inherently concentrated. Distribution firms often leverage their strength in their own particular stage of distribution into a role in content creation and content aggregation.

12.1.2.2 Myth #2: Technology Breaks Up Market Power in Distribution

New technology creates new and powerful methods of distribution: broadband internet, fiber optic networks, mobile wireless, and additional cable and satellite channels. More advanced distribution technology indeed means fewer technical bottlenecks, but not less market power for a distribution company. Technical advance is supposed to overcome traditional market power in distribution. But as we shall see, technology has raised the economies of scale of distribution networks, and hence reduces the number of players and raises their market power. Therefore, distribution markets become more rather than less concentrated.

12.1.2.3 Myth #3: E-Distribution Leads to the Disintermediation of Retailing and Wholesaling

The notion of disintermediation, in which manufacturers can deal directly with customers and leapfrog retailers, or wholesalers, or both, has been popular. But in fact retailers and wholesalers are needed and fulfill several essential functions. There are new types of distributors but the function itself does not disappear. On the contrary, the new distribution intermediaries are more powerful and central than ever.

12.1.2.4 Myth #4: Electronic Distribution Is Very Different from Physical Distribution and as a Result Everything Changes

People often make a big distinction between electronic and physical distribution, between the delivery of “bits” versus that of “atoms,” but in reality there are great conceptual, structural, and organizational similarities between these two types of distribution. In particular, both electronic and physical distributions are organized around networks, whose “architecture” is based on similar principles even if the technical nature of their components differs. Thus changes in the

competitive position of the major distributors are usually not inherent in the technology but in the inability of existing distributors to modify and adapt.

12.1.3 Distribution Networks

To discuss the nature of distribution in the media and information sector, we will start by looking at the central structure of distribution—networks.

Networks are systems for the distribution of products, raw materials, people, energy, and information. A network is a set of nodes that are interconnected by links, among which there is a flow of products or signals.¹

Examples of physical distribution networks, with their key technological breakthroughs and commercial introduction are:

- ships and barges (steamships, 1807, by Robert Fulton);
- railroads (1830, by George Stephenson);
- automobiles (1896, by Gottfried Daimler);
- pipelines (1870s, Rockefeller's Standard Oil Co.);
- airlines (1930s, Juan Trippe's Pan American).

Some networks are not made up of physical infrastructure at all, but exist as virtual relational systems among people. Old boy networks or networks of political supporters are examples. Business relationships are another example. Bill Joy, co-founder and chief technologist of Sun Microsystems (now a part of Oracle) expands on this: “The network is the economy and the network is the market.”² In other words, the entire economic system is a vast network, and it conducts its business as a network and on a network.

Markets are affected by distribution technology. When such technology consisted of pack animals, markets were local and simple. In time, carters and merchants established warehouses and wagon stations in order to store and transport goods over greater distances. Stage posts enabled the exchange of horses for speedy travel, food, and accommodation, and became the progenitors of a postal service, which in turn begat telecommunications networks such as the telegraph and the telephone.³ Port facilities were created for ships and barges. Regional transportation hubs emerged, and cities grew around them.⁴ When ships became an ocean-going distribution technology, markets became global. When railroad technology was introduced, national brands emerged.

Many content firms such as the providers of films, music, books, games, newspapers, TV and cable programs – actively distribute content to retailers. But other content companies tend to rely on third-party distributors such as independent producers of film, TV, and music, or magazine companies. For example, New Line Cinema, an American

film studio, does not distribute its own films internationally. Instead it relies on other companies, such as Warner Bros. in Germany and Metropolitan Filmexport in France.

Many media and information industries are in fact primarily distribution networks, including the telecom industry, Internet Service Providers (ISPs), and many cable and satellite firms. There are also media firms—such as Hollywood studios, major music distributors, TV networks and local newspapers—which combine their own content production with a distribution function, including often for third parties.

Before the nineteenth century, information was available mostly only as a physical product, such as letters or newspapers, and could travel no faster than people or animals (such as horses or carrier pigeons). For example, a piece of correspondence sent from New York to Chicago in 1800 took six weeks to arrive.⁵ By 1857, with the advent of the railroad, the same letter would get to Chicago in two days.⁶ Even this was still painfully slow from today's perspective.

Human beings have always searched for ways to speed up the physical delivery of information by moving to non-physical signaling. Early attempts included signals by drums, torch, or smoke. In 1810, Napoleon enlisted the inventor Claude Chappe to help run his empire and army by creating a semaphore telegraph. A message could be sent from Paris to Brussels at a peak speed of 100 miles per hour with the use of hilltop relay towers which signaled coded letters by way of changing the configuration of two long arms. However, the Chappe System had a low capacity, could only be used in good weather and daylight, and was limited to military and official use.

Electric data networks became a reality after 1836. Samuel Morse, a noted portrait painter, was driven by his wife's untimely illness and death—news of which had not reached him in time—to invent the electric telegraph as a means of rapid long-distance telecommunication. The US government financed the first telegraph line in 1844. Although limited by its capacity and requiring an operator to enter and read a “Morse Code,” the telegraph sent messages that could travel nearly at the speed of light. Soon, a telegraph line between Missouri and California put the Pony Express out of business. Telegraph networks exhibited the classic characteristics of network infrastructure: early government support, a near-monopoly by a dominant organization, followed by a regulatory role of government. In Europe and Asia, governments established their monopoly over telegraph networks and typically ran them through their state postal administrations.⁷ In the USA, the private company Western Union Telegraph, founded in 1851 by Hiram Sibley, soon achieved a near monopoly. A transatlantic telegraph line was laid in 1858 but only worked for one week. By 1866 the first suc-

1 Castells, Manuel. *The Rise of the Network Society*. (Malden: Blackwell Publishers, 2000), 470.

2 Schwerin, Rich. “Hardware and Software. Engineered to Work Together.” *Oracle*. November/December 2010. Last accessed June 26, 2017. ► <http://www.oracle.com/technetwork/issue-archive/2010/10-nov/ov60news-175809.html>.

3 Noam, Eli. *Telecommunications in Europe* Oxford University Press 1992.

4 Frederick Ross, David. *Distribution Planning and Control*. (Norwell, MA: Kluwer Academic Publishers, 2004), 60.

5 Pred, Allan R. *Urban Growth and the Circulation of Information: The United States System of Cities, 1790–1840*. (Cambridge, Massachusetts: Harvard University Press, 1973), 176.

6 Chandler, Alfred D. Jr. *The Visible Hand: The Managerial Revolution in American Business*. (Cambridge Massachusetts: Harvard University Press, 1977), 85.

7 Lines of the Western Union Telegraph Company. *Michael Schwartz Library, Cleveland State University*. ► <http://souther311.clevelandhistory.org/files/2011/11/westernUnion008.jpg>

cessfully working oceanic cable came into use. Since then the continents have been linked electronically. The next step was Alexander Graham Bell's telephone, which swept the world after 1876.⁸ Electronic information distribution networks kept evolving, with new technology generations following each other almost every decade. After a scientific and engineering phase, they spread widely.

- 1840s: telegraphy;
- 1880s: telephony;
- 1900s: wireless radio telegraphy;⁹
- 1920s: radio broadcasting;¹⁰
- 1940s: television broadcasting;
- 1960s: cable TV distribution;
- 1970s: communications satellites;
- 1980s: mobile cellular wireless;
- 1980s: packet data networks;
- 1990s: the internet;
- 2000s: fiber-based broadband networks.

12.1.4 Trends in Electronic Distribution

12.1.4.1 Trend #1: From Synchronous to Asynchronous

One must distinguish between two major types of networks. Most mass-media networks are one-way networks, with no (or limited) return paths. One-way networks distribute information from a central sender to numerous surrounding receivers; in TV or radio we call this way of distribution “broadcasting.” This distribution method allows the sender to send information to receivers as it is the same information for all. Many forms of physical distribution are, similarly, mostly one way in nature: water distribution, sewers, but also the retail distribution of newspapers and magazines. It is a “one-to-many” distribution.

On the other hand, the mail, telecoms, and internet are two-way distribution networks. They have multiple senders and receivers—a “many-to-many” connectivity. Transmission is individualized here, each sender and receiver communicating in a unique way with each other. Two-way users do not share the transmission in a synchronous fashion at the same time, as broadcasting does. Instead an asynchronous, or individualized, transmission is taking place, which requires the allocation of some transmission capacity such as a channel, a frequency, a packet stream, or a bandwidth. Since the aggregate capacity is limited, the transmission capacity between each pair of users used to be small.

Thus, in the past, there were two distinct types of information distribution networks. There were those that moved a lot of information shared by many, and those

that moved a relatively small amount of information on an individualized basis. Broadcasting and TV are examples of networks that moved a lot of information shared by many through electronic distribution. Telephone networks are an example of low-information, highly individualized distribution systems.

In terms of technical engineering, the shared broadcast pipes had a capacity of the equivalent of megabits per second (millions of bits), while the individual pipes of telephony voice were in the order of low kilobits per second, 1000 times less. However, we are now in the midst of a historical move from the skinny kilobit stage of individualized communications, to a fat megabit stage of individualized broadband networks, now emerging to the ultra (gigabit) stage, another 1000-fold increase. On top of it, individualized networks have also become mobile, and they are therefore geographically ubiquitous, in contrast to the fixed wireline networks, whose geographic reach was much more limited.

12.1.4.2 Trend # 2: From Analog to Digital

In the past, electronic information was produced, manipulated, stored, and transmitted in the form of signals of varying frequency and strength. Examples are music recording and transmission over the radio. The emergence of computers led to digital electronics, where each tone is instead given a number, and it is that number that then gets stored and transmitted. The number, in turn, is expressed in a binary fashion, with zero and one being the only two options. Thus the base ten numbers 1, 2, 3, 4, 5, 6, 7, 8, 9 are expressed in the binary base two mode as 1, 10, 11, 100, 101, 110, 111, 1000, 1001. The advantages are that these zeros and ones can be expressed on computer and other electronic devices as “on” and “off,” and are therefore highly convenient for data processing. They are easy to store, amplify, edit, transmit, encrypt, and compress. Semiconductor chips generally work with digital signals. Software is programmed in a digital way. As electronic technology has progressed in leaps and bounds, all information has moved to a digital form, all except the initial human interfaces of inputs and outputs, because our eyes and ears do not process number-coded signals but rather the frequency (high notes, colors), strength, luminance, and so on. Thus media devices need to transform digital signals into analog ones when they reach humans. A computer or TV monitor might be digital inside in its operations, but the signal it emits to the eye is analog. The opposite conversion takes place when the flow of information is reversed, from humans to machines.

All types of information can be expressed through numbers. Today, after decades of transition, virtually all media activities are digital. Film theaters have been moving to motion pictures that are digitally produced, transmitted, and exhibited, rather than being celluloid-based ones. Broadcast TV, after a complex transition, is digital, as satellite and cable TV already were. Music is recorded and stored (and often performed) digitally. What are the exceptions? Print books, newspapers, and magazines, though these, too, have been moving to alternative electronic digital formats. Terrestrial

8 Lindsay, David. “Alexander Graham Bell.” *PBS.org*. Last accessed July 7, 2010. ► <http://www.pbs.org/wgbh/amex/telephone/peoplevents/pande01.html>.

9 A World of Wireless. “Early Days of Wireless.” Last accessed July 7, 2010. ► <http://home.luna.nl/~arjan-muil/radio/history/history-frame.html>.

10 A World of Wireless. “Radio Days.” Last accessed July 7, 2010. ► <http://home.luna.nl/~arjan-muil/radio/history/history-frame.html>.

radio is usually analog, mostly because of the huge installed base of analog radio receivers that would be obsolete otherwise. Satellite radio and the slow-to-catch-on “HD-radio” are digital. Live performances are analog, though assisted by digital production technology. Vinyl music recordings have their aficionados. But those exceptions are mostly in the nature of legacies. Right now, the coding of information by zeros and ones is predominant, though if clever engineers find a still more efficient way to operate electronics, for example through a double-binary coding of 0, 1, -1 this could change again.

12.1.4.3 Trend #3: From Dedicated Pathways to Intermingled Packets

In the old days, the communication between two parties required that a dedicated circuit be established between them, at least while they were communicating. This was relatively inefficient because it did not occupy the entire capacity of the communications link. Things changed in the 1970s, when the US military sponsored the first “packet” networks. In packet communications the message is broken down into short chunks of those digital 0s and 1s, and they are bunched together just like a letter and sent off into the network to seek their destination. A packet contains three parts: an information “payload”—the actual information—which is surrounded by operational information. There is a “header” with details about the destination and the sender, just as it is on the envelope of a letter.¹¹ With this header information, packets can be routed toward their destination. There is also a “footer” to end the packet. This method fills channels efficiently.¹²

A typical packet payload contains about 1000 to 1500 bytes, with the maximum size for a packet in the internet protocol (IP) IPv4 set at 65,535 bytes, usually referred to as 64 kilobytes. In terms of text, 1500 bytes are about 250 words, about the length of a typed page, and about 45 pages for a maximum packet load. For audio transmission (at the quality level of streaming of Pandora or Spotify, which transmit at 192 kbps), a full-sized packet could transmit about three seconds of audio, and less if the packet is not loaded to its maximum. For video, which transmits at about 10 Mbps for high definition video on streaming services, such as Netflix, a fully loaded packet would contain about 1/20th of a second of video. The next generation IP, IPv6, permits “jumbo packets” in specially configured complex networks, and this has reached packet sizes of 4 GB, which would support about 50 minutes of such video.

Much of data communications and the internet are based on packets being routed and handled according to an agreed-upon protocol known as TCP/IP. The information transmitted includes text, images, audio, voice, and video. Various devices understand this protocol and follow it. This creates compatibility, interoperability, and efficiency.

12.1.4.4 Trend #4: From Copper to Fiber

Fiber has a gigantic capacity, and even more in reserve for the future. In addition to glass fiber strands being a superb way to move light signals at extremely fast rates over long distances without frequent reamplification, one can also send simultaneously signals of different wave lengths (“colors” or “windows”) on the same fiber. One can send 1000 wavelengths per strand, though a lower number is generally used. The transmission rate can be, with present technology, 10 billion (giga)bits per second per window. Moreover, a single fiber strand can have several “cores.”

For cable distribution, there were typically 35 analog channels in 1976 with 250 Mhz of bandwidth, 80 channels in 1994 with 550 Mhz, and 180 channels in 2000 with 1 gigahertz. Digitalization increased channel capacity with 6:1 compression, likely to rise to 10:1 or 12:1. With such compression, 2000 channels are possible in engineering terms. This capacity rises still further with progress in electronics and fiber-based cables. Optical fiber is cheaper than coaxial cable per mile and per channel. However, a more expensive conversion equipment (optical/electronic) is required at each end. Because the physical installation of fiber in the home is labor intensive, the compromise is typically a fiber/coax hybrid, with the home segment being coax. In 2015, researchers were able to transfer at the rate of 255 terabits per second on fiber utilizing 50 windows and seven cores.¹³ Such bandwidth, when it reaches operation, is theoretically capable of simultaneously transmitting 520 million compressed video channels over a single fiber strand. For a fiber cable with 12 strands this would equate to about 6 billion channels. While such channel quantity would not be feasible or economical on the consumer level, it means that transmission could be greatly individualized while still providing a lot of capacity per user. In the above example, the transmission capacity could be split among 10 million users and still leave each with 600 individualized video channels. This suggests that transmission capacity is ceasing to become a constraint. This will change the face of media in terms of content format, business organization, and policy.

12.1.4.5 Trend #5: From Wire to Wireless

Whereas in the past most electronic communications traveled by wire, this is changing, to a certain extent. Cellular mobile communication has now reached almost 5 billion people, more than 60% of the world’s population. Not only does it connect people but it also enables them to do many new things in new ways. Yet it would not be quite correct to call it a pure wireless technology, since it is mostly the “last mile” of communication that is wireless, while the core of networks is fiber based. Technology has moved the frontiers of wireless technology in several ways, including:

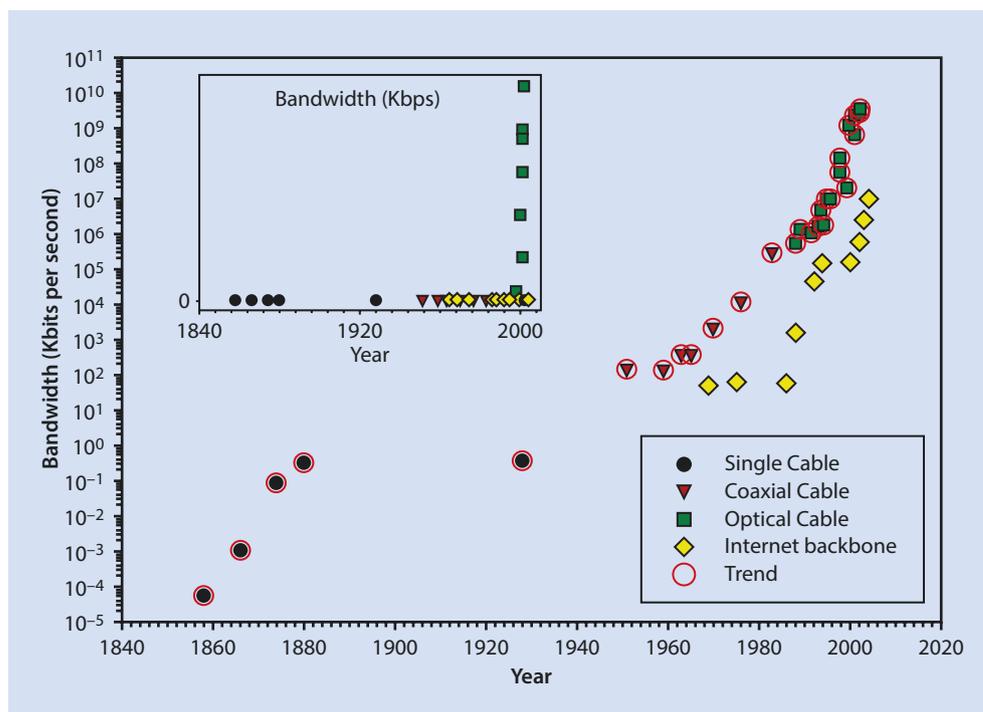
- The ability to handle increasingly high frequencies.
- Satellite-based transmission: microwave antennae, located high in the sky, often stationary and synchronized with

11 The header also includes an automatic error detection and correction.

12 However, the “bursty” transmission makes real-time connection difficult when the channels are near congestion.

13 Anthony, Sebastian. “255Tbps: World’s Fastest Network Could Carry All of the Internet’s Traffic on a Single Fiber.” *ExtremeTech*. October 27, 2014. Last accessed June 26, 2017. <http://www.extremetech.com/extreme/192929-255tbps-worlds-fastest-network-could-carry-all-the-internet-traffic-single-fiber>.

Fig. 12.1 Trend of transmission speed (capacity) of communications links over time



the earth's rotation, and solar powered, enabling coverage by a satellite of a third of the earth's surface, and permitting extremely accurate navigation systems.

- An ability to share and reuse frequencies by intelligently linking millions of small “cells,” thus enabling ubiquitous mobile cellular communication.
- Wireless home and office networks (wi-fi) linking multiple devices.

12.1.4.6 Trend #6: Interconnected Data Networks

Stand-alone computers and other devices were linked together in local area networks (LANs). LANs, in turn, were connected to each other by wide area networks (WANs), by metropolitan area networks (MANs), and by global network systems, most particularly the internet.

12.1.4.7 Trend #7: From Narrowband to Broadband Networks

While in the 1990s the driver of change was the progress in semiconductors that heavily increased computing power, in the 2000s the main driver has been optics, which has drastically decreased the price of transmitting information. According to Gilder's Law, bandwidth grows at least three times faster than computer power. Moore's Law forecasts that computing power doubles every 18 months, communication power will double every six months, and total bandwidth of communication systems will triple every year for the next 25 years. **Figure 12.1**¹⁴ shows the exponential nature of transmission technology in terms of throughput capability of a transmission link.

12.1.4.8 Trend #8: From Expensive to Cheap Transmission

Mirroring the enormous rise in transmission capacity, the cost to transmit information has dropped precipitously. The capacity to move 1 GB of information per second cost \$2.07 in 1996. In 2008, it was \$0.40. In 2014, Netflix paid about \$0.01.¹⁵ In 2016, Akamai was charging \$0.002.¹⁶ For \$1 one could transmit the content of 781,000 books of 400 pages each.

12.1.4.9 Trend #9: From One-way to Two-way and Multi-way

Traditionally, the communication of content distributors such as newspapers or TV networks with their customers was purely one-directional. Increasingly customers can give direct and immediate feedback.¹⁷ Still more interestingly, users can interact with the content itself, and with each other. This is particularly the case in multiplayer video gaming. It is likely to become the case for other types of video as well.

¹⁵ Rayburn, Dan. “Here's How the Comcast & Netflix Deal Is Structured, with Data & Numbers.” *StreamingMedia*. February 27, 2014. Last accessed June 26, 2017. <http://blog.streamingmedia.com/2014/02/heres-comcast-netflix-deal-structured-numbers.html>.

¹⁶ Rayburn, Dan. “Akamai Slashing Media Pricing in Effort to Fill Network, Won't Fix their Underlying Problem.” *StreamingMedia*. September 14, 2016. Last accessed June 26, 2017. <http://blog.streamingmedia.com/2016/09/akamai-slashing-media-pricing.html>.

¹⁷ Netflix paid \$400 million a year for providing 3.3 billion gigabytes of data delivery to its customers per month, i.e., 40 billion gigabytes per year. Thus, it paid about 1 cent per 1 gigabyte transmission. Taking into account that an average subscriber uses 50 to 100 gigabytes per month, Netflix has total transmission costs per customer of \$0.5 to \$1 a month. Moreno, Jose. “From analog to digital: How digitization affects the production, distribution and consumption of information, knowledge and culture in the network society.” *Academia*. Last accessed June 26, 2017. http://www.academia.edu/4804371/From_analog_to_digital_How_digitization_affects_the_production_distribution_and_consumption_of_information_knowledge_and_culture_in_the_network_society.

¹⁴ Reprinted from *Technological Forecasting & Social Change* Vol. 73 no. 9, Heebyoung Koh & Christopher L. Magee, A functional approach for studying technological progress, 1061–1083, 2006, with permission from Elsevier.

12.1.5 Case Discussion

Media Distribution

The German firm Bertelsmann is one of the world's most diversified, internationalized, and largest media companies. It is deeply rooted in several media operations whose distribution is being transformed. Adapting to these changes and formulating a fundamental strategy for the future will be Bertelsmann's key to success.

The Bertelsmann company was founded in 1835 as a publisher of hymn books in Germany, with an anti-liberal theological perspective. It became a medium-sized book publisher located in the small town of Gütersloh. The firm grew large, and in time became Nazi Germany's largest supplier of propaganda books. After World War II, a transfer of control was mandated to the owner's young son Reinhard Mohn, who in the 1950s and 1960s successfully took the firm into book clubs and magazines. Later, ownership was transferred to the Bertelsmann Foundation, controlled by the Mohn family. The firm moved into music, film, and TV under Chief Executive Officer (CEO) Mark Woessner (1983–1998), and then into internet media under CEO Thomas Middelhoff (1998–2002). In 2002, Middelhoff and his online vision were ousted and replaced by Günter Thielen, who represented the more traditional business entities. Subsequent CEOs were Hartmut Ostrowski (2008) and Thomas Rabe (2012).

In 2017, Bertelsmann had 119,000 employees (about 40,000 in Germany) and was active in 50 countries. Bertelsmann's structure is highly decentralized. Its 2017 revenues amounted to approximately \$20 billion. Of this, 37.6% came from TV (the RTL Group, including its film company UFA and the British TV producer Freemantle), 28% from outsourcing business services (Arvato), 14% from magazines (Gruner + Jahr), 13.5% from books (Penguin Random House), and 7.3% from printing (Be and others).

The RTL Group, Europe's largest broadcaster, has 31 television channels and 33 radio stations in ten countries, with a global audience of 250 million. RTL is engaged both in content production and rights licensing, with 19,000 hours of content broadcasting rights in 150 countries.

Bertelsmann has owned since 1964 UFA (Universum Film AG), a major German film producer (and Germany's largest film company in the 1920s and 1930s), and

through it Freemantle, a major TV show producer (*American Idol* and its many national variations, as well as *The Price Is Right*, *The X-Factor*, etc.)

Penguin Random House, created by a 2013 merger of Bertelsmann's Random House and the UK publisher Pearson's Penguin Group, is the world's largest general-interest book publisher. It puts out approximately 9000 new book titles per year. Random House's presence is strongest in the USA, UK, Spain, and Germany. Random House authors include John Grisham and Toni Morrison. Pearson published D.H. Lawrence, Salman Rushdie, and John le Carré.

Gruner + Jahr, for many years Germany's largest magazine publisher, has 120 magazine titles in nine countries, and also has strong magazine brands in France, Poland, Austria, Italy, Spain, and Russia. It owns five newspapers in Germany as well as the online portals of major magazines.

BMG Music Entertainment (Bertelsmann Music Group) used to be one of the world's top five major music companies. In 2004, it merged its music operations with those of Sony, but then sold its share to Sony several years later and its music publishing to Universal Music Publishing. BMG Rights Management still holds the rights to about 100,000 songs, for which it handles the marketing and artist management.¹⁸

Arvato provides post production, fulfillment, distribution/supply chain management, and hosting services for information technology (IT) systems. It provides business-to-business (B2B) services for various industries: customer relations services, e-commerce, financial solutions (e.g. risk management, payment transactions, collection), IT outsourcing, digital marketing, business intelligence and analytics, supply chain management, and many other services related to the creation and distribution of printed materials or the digital storage of media.¹⁹

Be Printers is focused on internal and third-party printing services for magazines, catalogs, book publishers, and others.

For many years, "media clubs" were a key sales channel for Bertelsmann's music and book publishing. Direct Group's media clubs, both general and special interest, had 32

million members in 22 countries, although this declined to 15 million customers in 16 countries. This is still the world's largest.

Bertelsmann is a major European online video company, through the RTL Digital Hub, which includes Broadband TV Style Haul, as well as the online advertising service SpotXchange.

For many years, Bertelsmann distributed its content in the traditional way: analog and physical. Figure 12.2 shows how dominant physical distribution was at the turn of the century—books, magazines, music CDs, films—and how rapidly it was being transformed into electronic distribution, primarily digital in nature.

In a 2012 article, Germany's major news magazine *Der Spiegel* criticized Bertelsmann for having had "a lost decade" and for being far behind competitors, including German media firms such as Axel Springer AG, in terms of online operations. *Der Spiegel* argued that Bertelsmann's problems had started when it focused on the buyback of shares from the Belgian firm GBL instead of investing in future-oriented online activities.

Digital TV increases distributive capacities and the number of channels. The proliferation of other distribution platforms with multiple channels and of on-demand and pay channels squeezes traditional broadcast TV distribution and advertising, its economic foundation. Online-based video accelerates this trend.

Consolidation in online and offline retail increases these sales channels' bargaining power. Audio and ebook distribution platforms rise in importance relative to traditional paper/print.

Channels of distribution have become expensive for non-subscription magazine sales. Competition for shelf space, for example in supermarkets, has been fierce. Online distribution platforms for magazines have grown in importance, but yield much lower revenues per subscriber. On the other hand, they are cheaper to operate and have a wider global range.

Retail chains squeezed out small independent music retailers and generated bargaining strength. Then they succumbed themselves to online distributors, both for physical and electronic products. Online music has battered music companies and their wholesale and retail distribution. The

18 Sony Music. "Sony Music Entertainment." 2010. Last accessed July 7, 2010. ► <http://www.sonymusic.com>.

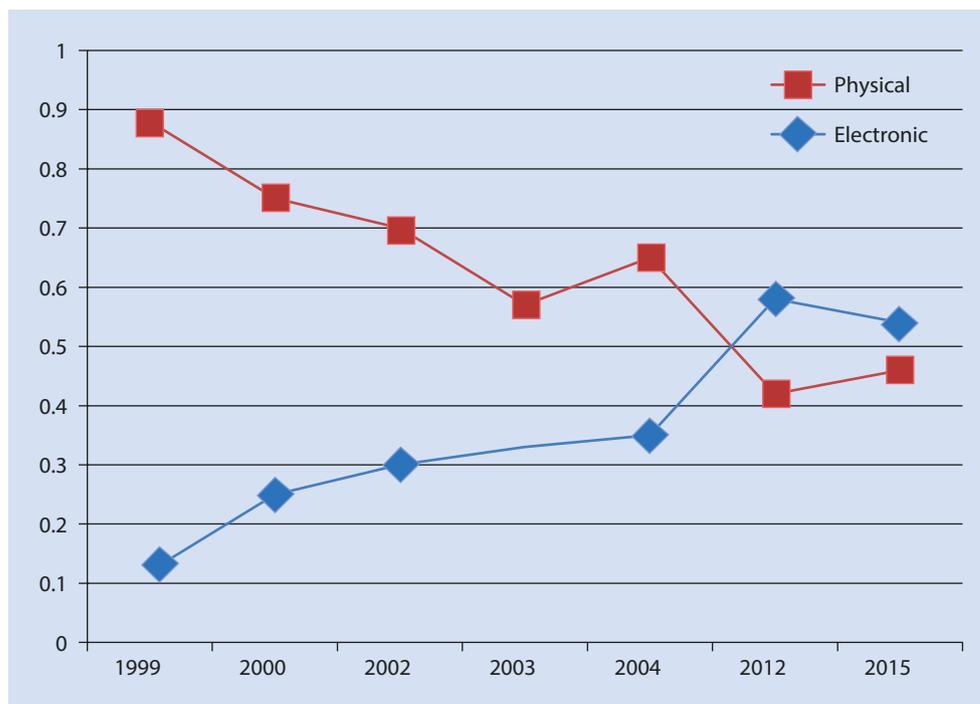
19 Bertelsmann. "Official Website—Company Profile". Last accessed June 26, 2017. ► <http://www.bertelsmann.com/company/company-profile/>; Arvato. "Solutions and Industries" Last accessed June 26, 2017. ► <https://www.arvato.com/en.html>.

rise of download portals (e.g. iTunes) and of streaming music reduces the relevance of physical distribution.

The questions that Bertelsmann's management thus has to face include:

- What impact has the trend to broadband communications had on Bertelsmann's distribution and operations?
- What are Bertelsmann's main challenges in the distribution of its various media operations?
- How has Bertelsmann's content production benefited from its distribution activities?
- What is the impact of the move to broadband (high capacity internet) communications on Bertelsmann?
- How are the supply chains of Bertelsmann's several business units being affected?
- Will the challenges of digital network distribution force Bertelsmann to become a partly content-based company? Will they force Bertelsmann to become much more of a technology company?

Fig. 12.2 Bertelsmann physical versus electronic distribution



12.2 The Economic Characteristics of Distribution Networks

How is the distribution of media and information products different from distribution more generally?

12.2.1 Economies of Scale

The design of a network will be determined by the economies of scale of its technology on the supply side. In addition, network effects (discussed below) exist on the demand side and strengthen scale economies.

Of the economic factors that shape distribution in the media industry, perhaps the key factor is the characteristic of high fixed cost, low marginal cost. Studies have often shown economies of scale (cost-elasticity with respect to size) of 5–10% in the telecoms industry. Similar economies of scale

have also been identified in other markets for the long distance telecoms market,²⁰ and the cable TV market.²¹

The consequences are advantages to large size and to high market share on the supply side of distribution services.²² There are also advantages to early entry. This explains why distribution network industries are almost always highly concentrated, meaning there are only a few companies providing distribution services in a market. For instance, in the

20 Denny, Michael et al. "Estimating the Effects of Diffusion of Technological Innovations in Telecommunications: The Production Structure of Bell Canada." *Canadian Journal of Economics* 14, no. 1 (1981): 24–43.

21 Noam, Eli. "Economies of Scale and Regulation in Cable Television." In *Video Media Competition: Regulation, Economics, and Technology*. Ed. Eli Noam. (New York: Columbia University Press, 1985), 93–120.

22 Bates, Benjamin J. and Kendra S. Albright. "Issues in Network/Distribution Economics." In *Handbook of Media Management and Economics*. Eds. Alan B. Albarran, Sylvia M. Chan-Olmsted, and Michael O. Wirth. New York: Lawrence Erlbaum Associates, 2006.

USA there exist four national package delivery systems: the traditional postal service USPS, as well as UPS, FedEx, and DHL. There are only three or four major national airlines left, after a period of consolidation, upheavals, and bankruptcies. Most nations have only one or two national passenger airlines.

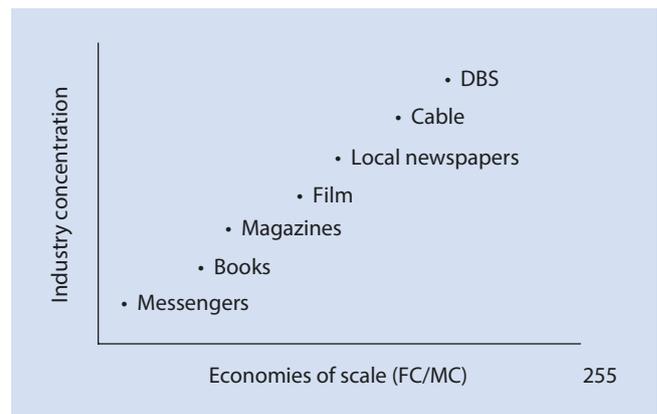
There is a similar concentration in railroads. In the USA, 92% of rail freight is being transported by seven Class I freight and track railroads, two of which are extensions of Canadian systems. These railroads are mostly territorial and have a route monopoly. In most countries there is a single railroad track company. In the USA there is one national intercity passenger rail system, Amtrak, and one national bus network, plus regional and federated ones.

In most countries, there is one dominant wireline telecoms company, (though there may be one or two rival long-distance or business-oriented transmission networks), and three or four mobile wireless providers. There is typically one local cable provider regionally, and one or two direct broadcast satellite (DBS) services.

Looking beyond infrastructure, we also observe that the number of distributors for content products is small. In the USA there are six main Hollywood film distributors and three music distributors. These distributors are strong in most other countries too. In Japan, there are three major Japanese film distributors, Toho, Shochiku, and Toei, plus the Hollywood firms. In India, the prominent film distribution companies are Rajshri Productions, Yash Raj, and Eros.²³ In France it is Vivendi, in Germany UFA.

Economies of scale do not mean that smaller firms cannot survive. The large firms often become inefficient, and their costs rise. Inefficient monopoly operations may offset the advantages of scale. The implication for a new entrant, when the incumbent's costs have crept up, is to challenge the incumbent on price. This was indeed how in telecoms in the 1980s new entrants such as MCI, Mercury, and DDI took on the established monopolists AT&T, BT, and NTT. In time, however, the much larger incumbents got their costs under control and could reassert their larger scale economies. The lesson for entrants therefore is to use price and cost advantages only as the opening wedge, and soon shift to product features and differentiation.

The design of networks (the “architecture”) is based on the relative cost of transport links versus nodes. The market structure of distribution networks is not determined by the absolute cost of distribution but by the relative cost ratio of fixed versus marginal cost (or fixed versus total cost) that determines market structure. The higher the ratio of fixed costs to marginal costs (FC/MC), the greater the economies of scale. Where that ratio is highest, economies of scale are highest, and with them the market concentration. ■ Figure 12.3 schematically illustrates this relationship. FC/MC is high for industries such as cable



■ Fig. 12.3 Economics of scale in media industries (schematic)

TV and for broadcast satellite. FC/MC is intermediate for magazines and book distribution, and there the market concentration is intermediate. FC/MC is low for bicycle messenger services. Most of the cost is the labor of biking to the destination, not in the bike itself. Thus, entry barriers and market concentrations are low.

The trend of this cost ratio is to rise. Electronic networks are becoming more expensive in their required upfront investment and less expensive in their marginal cost of bit transport. Fiber, cable, and wireless networks have a high FC/MC ratio.

But physical distribution networks, too, are raising the FC/MC ratio. Companies such as FedEx and DHL create complex national and international distribution networks with high fixed costs and (relatively) low marginal cost. This shift to a higher FC/MC ratio leads to national systems of physical distribution. With the FC/MC ratio generally higher for electronic than for physical distribution, the implications are of higher economies of scale in e-distribution and hence of a greater market concentration of services for electronic distribution. For the physical distribution of media products, too, fixed costs rise while marginal costs decline. Physical distribution by Netflix (DVDs) or by Amazon.com (packages) are examples. As a result, the largest firms have a cost advantage, when scale is high.

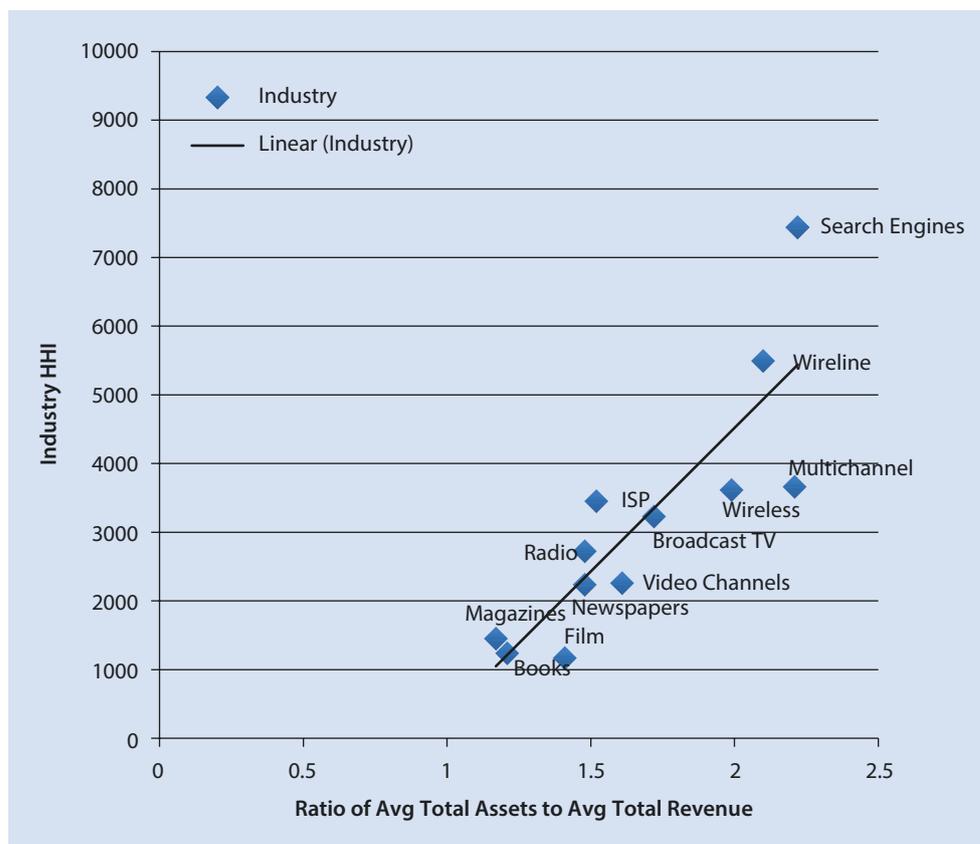
One can see this relation of fixed (capital) cost to operational (marginal) cost in ■ Fig. 12.4. Here, the average market concentration (the so called HHI concentration index) is graphed on the vertical axis for 13 media industries, averaged across 30 countries' concentration figures. The horizontal axis shows the capital intensity—the ratio of total assets to total revenues. As one can see, there is a strong correlation: industries that are capital intensive are more concentrated.

12.2.2 Network Effects

Networks tend to have a fundamental economic characteristic: the value to a user of connecting to a network depends on the number of other people already connected to it. This

23 ISSUU, “Indian Film Industry: Distribution Sector,” November 2, 2008. Last accessed July 25, 2011. ▶ https://issuu.com/gbijumohan/docs/indian_film_industry_-_distribution_and_exhibition.

■ Fig. 12.4 Capital intensity and media industry concentration (Average 30 countries)



is known as network effects, network externalities, spillover effects, or demand-side economies of scale. The larger the network's reach to others, the more value it provides to its users. A large number of participants encourages third parties to develop special applications. Examples are the wide range of software products for computers using the Microsoft Windows operating systems, of tools for eBay, or of apps for the Apple iPhone.²⁴

Network effects were described by the inventor of the Ethernet, Robert Metcalfe, as a "law," according to which the total value (V) of the network to all users (n) increases exponentially as the number of users increases, as defined by:

$$V = an(n-1) = a(n^2 - n)$$

a is a scaling parameter.

For example, if the value of a network to a single user is \$1 ($=a$) for each other user on the network, then a network size of ten users has a total value of \$90 ($10^2 - 10$). The average value is then \$9. If the network grows to 100 users, its total value is \$9900. The average value for a user rises from 9 to 99, about tenfold. A tenfold increase in the size of the network leads to a hundredfold increase in its value. Therefore, according to Metcalfe, the network value rises by roughly the square of the number of its terminals: $V = an^2$.

George Gilder, a noted high-tech guru, expanded this by having the value of a network growing by the square of the processing power of all the terminals attached to it. David Reed, an MIT professor, took a further step and postulated a Law of Community Effect, which conjectures that the value of a network grows exponentially to its size, or $V = a^n$. This suggests a much greater impact of network connectivity than in Metcalfe's formula.

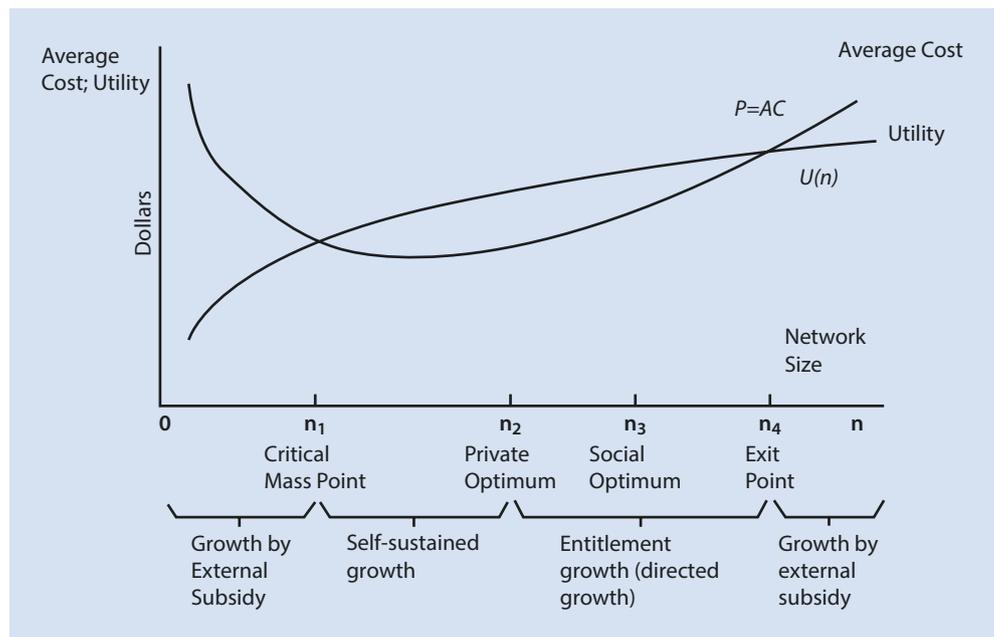
There are specific business implications of network effects:

- A small separate network is less attractive to users and hence less competitive, all other factors held equal.
- A larger network can charge a higher price since the ability to users is higher.
- Interconnectivity to large networks is important to a small network, because this raises its value to customers. Where the interconnectivity becomes essential, such as by small telecom operators into large incumbents' networks, it has generally led to regulated access rights under some pricing rules.
- Correspondingly, the control to access to a large base of users can be a company's greatest asset.

Network effects have an impact on demand. If the average value (utility) of the service increases with the number of other participants, then demand increases with the size of networks. If the network effect is large, it affects the shape of the demand curve in unusual ways. Generally, demand is

²⁴ Goolsbee, Austan D. "Why the Network Effect is so Striking," *Financial Times*. September 27, 1999, 14.

■ Fig. 12.5 Network size and its cost and utility characteristics



inversely related to price. The lower the price, the higher the quantity demanded. But here, the demand curve may actually slope upwards—that is, the larger the quantity demanded, the higher the value to users, and hence the higher the willingness to pay.

■ Business Strategies to Create “Network Effects”

To generate network effects, a company might resort to some of these activities:

- being the “first mover”;
- creating a “buzz”;
- undercutting rivals by “vaporware” announcements;
- investing in rapid expansion;
- subsidizing early adopters;
- targeting influential users;
- implementing low (“penetration”) prices;
- creating alliances;
- generating complementarities;
- facilitating early interconnect, making it difficult to interconnect once use is achieved;
- creating barriers to rival networks.

Economies of scale and network effects operate together in affecting demand and cost. ■ Figure 12.5 shows cost and the benefit expressed (utility, on the vertical axis) for networks of different sizes (number of users, on the horizontal axis). The U-shaped curve depicts average cost to a network provider. Such cost at first declines with size as the fixed cost is distributed over more users (economies of scale), but eventually it rises as the cost of service to less readily accessible users rises (marginal cost). The second curve, with its inverted U-shape, shows the utility to a user. That utility rises with the size of the network as it adds users. But the incremental value of additional users declines.

In ■ Fig. 12.5 there is a point of “critical mass,” labeled as n_1 , where the two lines intersect. Before reaching critical mass, the average cost of the network is higher than the average benefit (utility). If charged a price equal to average cost, a typical potential user would not sign up. But if a lower price is charged the network is economically unsustainable. However, after reaching critical mass, as the network grows net benefits become positive, and the network becomes self-sustaining, with the ability to grow on its own. The size that a profit-maximizing firm would choose would be where the utility curve is farthest from cost and per-user profit is highest, at the private optimum size n_2 and not further. But because additional participants on the network also convey externality benefits to society as a whole and these benefits cannot be captured through user fees, the social optimum is higher, at a point n_3 (which could be substantially further to the right, depending on the magnitude of the positive externalities). To grow beyond n_2 typically requires regulatory mandates on the network operator, borne by the network users as an internal cross-subsidy. Beyond n_4 , however, such an internal subsidy becomes high enough for users to drop out as cost exceeds utility. Beyond that point, therefore, an external subsidy becomes necessary again.

The right tail of the network graph depicts the “universal connectivity” policy issues, while the left tail shows the problems of achieving a critical mass in the first place. There is a chicken and egg situation. A network needs to have many users to be sustainable, but users want a large network with high network effects before joining.²⁵ In the pre-“critical mass” range of network size, where individual utility is less

25 Economides, Nicholas and Charles Himmelberg. “Critical Mass and Network Evolution in Telecommunications.” *Toward a Competitive Telecommunications Industry: Selected Papers from the 1994 Telecommunications Policy Research Conference*. Ed. Gerald W. Brock. (Mahwah, NJ: Lawrence Erlbaum Associates, 1995), 47–65.

than average cost, the network therefore requires an internal or external subsidy which will allow it to stay in business and hopefully grow. For example, early government support helped put the internet on track to growth. In other cases, the network operator will subsidize the early stages of the network, hoping to recoup later.

High network effects, economies of scale, and the need for early internal subsidization are the reason why distribution networks are usually highly concentrated in a few companies. Content creation, on the other hand, has lower entry barriers for newcomers and is less concentrated. Today, there are thousands of people and organizations that want to, and could, create the next hit film or song, and thousands more who want to be, and could be, aggregators of content. But there are few people who have the resources to create the next large distribution network and compete successfully.

The internet, too, is becoming concentrated in its distribution role. Typically, there are only two serious infrastructure networks for broadband: incumbent cable, incumbent wireline telecom companies, and providers, if they exist. Mobile telecom operators can add two or three platforms but at a lower speed. In some countries, independent companies use the infrastructure of the telecom firms to provide digital subscriber lines (DSL) internet service on top of it. This is like several bus companies using a single highway. But this competition is among bus companies, not among road systems, and if the single Highway Authority also operates its own bus service, this inevitably creates problems for the competitors, which leads to some form of regulation.

12.2.3 The Role of Government

For the free flow of information a well-functioning system of distribution without gatekeepers is essential. The role of government is to encourage the creation of distribution infrastructure and to protect it against dominance by a handful of distribution companies through which commerce and information flow. Governments thus might impose anti-monopoly restrictions on distributor power and on the vertical integration of production with distribution. Or, they might establish regulatory policies such as common carriage for telecom and “net neutrality” for the internet. Or governments will own the distribution platforms themselves, providing affordable access to all. In other cases, governments will license the providers of distribution networks, for example for TV broadcasting, cable and satellite TV, or telecoms. The number of such licenses is limited and they usually come with regulatory conditions.

Often governments will provide subsidies to establish a widespread distribution system that reaches all parts of a country and society. This applies to railroads, highways, telecom networks, and TV. In other cases, governments seek to control information through a control over such distribution facilities.

12.2.4 Price Deflation

The prices for electronic distribution have dropped enormously. As mentioned, in 1984 it cost \$1.8 million per year to lease a T-1 line (1.5 Mbps) between New York and Los Angeles. In 2000 the cost was \$63,348 a year. In 2008, it was \$8000 and in 2015, \$880. In mobile wireless, average per-minute voice prices in the USA (pro rata for actual consumption) have fallen from 47 cents in 1996 to 10 cents in 2010 and 5 cents in 2015.²⁶

As we can see in [Fig. 12.6](#),²⁷ distribution costs for a unit of information (a megabyte, or 1 million bytes, or 8 million bits, the rough equivalent of 500 pages of text, or one minute of a song, or half a second of HD video) have been dropping for over a century, as new forms of delivery have been introduced.

These trends create a fundamental instability in competitive distribution of network industries. More capacity is offered at lower prices, and with the equilibrium competitive price at near marginal cost, that is very low. As prices drop, many competitors fail and markets then consolidate.

12.2.5 The Vertical Integration of Distribution with Production

It can be cheaper to combine distribution with production, or of wholesaling with retailing, when there is a complementarity of the two functions in a chain. This can be expressed as $C(X + Y) < C(X) + C(Y)$. This means that the cost C to produce both X and Y is less than it costs to produce them separately. This is known as synergies or as economies of scope. However, the statistical evidence for economies of scope tends to be inconclusive. Sometimes they exist but often they do not.

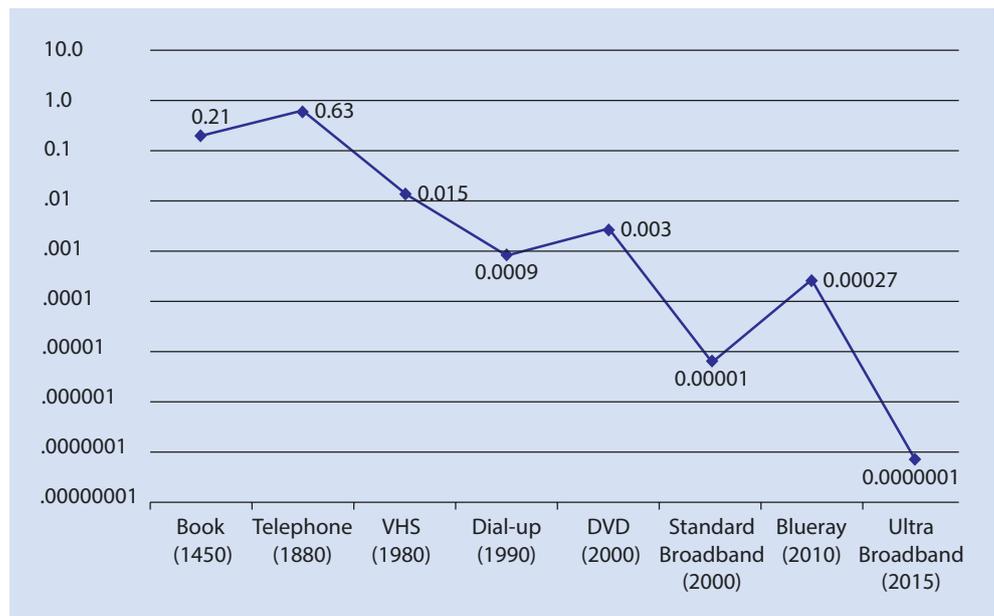
What are the business strategy implications where economies of scope indeed exist? The answer is vertical expansion by producers into distribution, and vice versa. Where these synergies are modest or non-existent, the purpose of vertical integration is not efficiency but market power over distribution or production.

In media, there have been many instances of vertical expansion to gain synergies. Hollywood studios have extended their operations into TV networks. Telecom companies have moved into video and online content. Cable companies have entered both telecom service and content production. All of them have also expanded into the internet business. The benefits of vertical integration of production and distribution may be that integrated firms are closer to the end users. This creates a feedback loop that may strengthen the production process and lower transaction costs. Changes in consumer demand can then be dealt with faster. This can benefit companies

²⁶ Monthly bill minus data and text charges, divided by voice minutes used.

²⁷ Noam, Eli. “If Fiber is the Medium, What is the Message? Next-Generation Content for Next-Generation Networks.” *Communications & Strategies*, Special Issue, (November 2008): 27.

Fig. 12.6 Cost trends of moving information (1 Mb)



whose product lifecycles are very short.²⁸ Other further benefits to vertical integration are easier communication between parts of the supply chain and the sharing of information without the fear of leaking company secrets. With fewer layers in distribution they can get products out faster.

Companies have extended this argument to distribution across multiple platforms and distribution channels. By owning several such platforms, they could fine-tune the release of a media product. However, most coordination advantages of vertical integration can also be achieved by contracts among the two companies in a vertical chain rather than in-house vertical integration. This can mean coordination with other products too. The *Lord of the Rings* film trilogy had a synchronized release strategy. This affected not only the films but also the issuance of subsequent video games, toys, soundtracks, and other products related to the trilogy.²⁹

But there are also drawbacks to vertical integration. One is the often-underestimated difficulty of integrating these very different operations and cultures. There are also costs

owing to being a “captive” producer or distributor. Take for example Disney, a film producer integrated vertically with one of its distribution operations, the major TV network ABC. As mentioned before, Disney TV Productions should sell its programs to the highest bidder rather than being locked into offering them to its own intra-company sibling ABC. Likewise, the ABC network should aim to buy the program that fits its needs best, whether produced by Disney or not. Furthermore, synergies are not always positive, but can be negative. For example, at one time several traditionalist “pro-family” activist groups launched a boycott against Disney films, despite the company’s strong family-friendly brand image, as a protest against ABC’s allegedly pro-gay content and internal human resources policies.

Thus it is for efficiency reasons that some media companies have voluntarily broken up their vertical integration of production and distribution, and spun off one or the other. Examples are Viacom (for a while), Time Warner, NewsCorp., and Vivendi.

12.2.5.1 Case Discussion

| Vertical Integration | | |
|---|---|---|
| <p>Bertelsmann’s distribution has often been vertically integrated with content production.</p> <ul style="list-style-type: none"> — Music: Bertelsmann’s music labels (production) were tied to “media clubs” and the major music group BMG (distribution). — TV: RTL, UFA, Fremantle, and CLT (production) tied to the broadcaster RTL, M6, and Antenna3 (distribution). — Film: UFA provides both production and distribution. — Books: Penguin Random House with numerous other publishers and imprints | <p>(production/distribution); RHPS, VVA, TBS, and GBS (distribution).</p> <p>Beyond its own book distribution operations, Bertelsmann offers services to other book publishers. It also distributes the works of independent music labels and film producers.</p> <ul style="list-style-type: none"> — In contrast, Bertelsmann’s role in the distribution of magazines, where its publishing house Gruner + Jahr is a major European presence, is limited. — Bertelsmann’s various media operations, | <p>Random House, RTL, Gruner + Jahr, and the Direct Group, deploy entirely separate distribution systems.</p> <p>The questions are: What are the synergy efficiencies for Bertelsmann’s content units that are due to their distribution networks? What causes them? What are the potential synergies between the various distribution units? (e.g. for music and books)?</p> |

28 Madhok, Anoop and Thomas Osegowitsch. “Vertical integration is dead, or is it?” *Business Horizon* 46, no. 2 (2003): 25–34.

29 Dalecki, Linden. “Hollywood Media Synergy as IMC.” *Journal of Integrated Marketing Communications* 8, no. 1 (January 2008): 47–52.

12.3 Network Models

12.3.1 Distribution Architecture

There is a great conceptual similarity between physical and electronic distribution modes. Both have similar network architectures. They consist of:

- transport links (roads, tracks and air routes for physical transports; wire lines and wireless links for electronic services);
- nodes (switchyards, airports, ports, warehouses, etc. for physical distribution; broadcast transmitters, cable head ends, phone switches, data routers for electronic distribution);
- peripheral user interfaces (checkout counters, bus stops, phone handsets, TV sets, personal computers, etc.).

Distribution systems, whether physical or electronic, use similar major types of “architecture,” also known as “topology”—that is, basic structural designs. The architecture of a network refers to its overarching construction, based on various nodes and connection links to one another. There are several basic models.

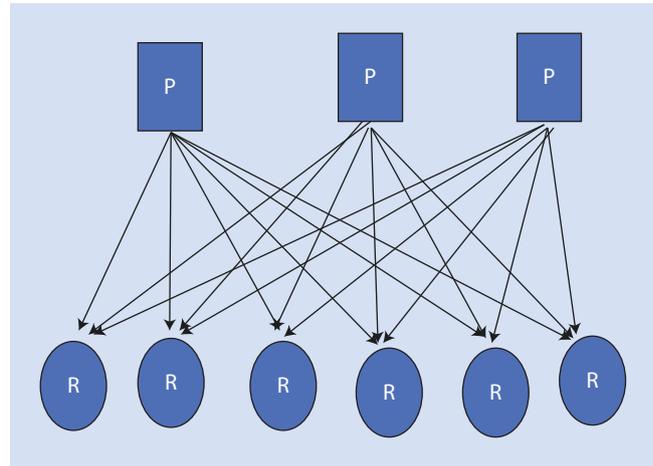
12.3.1.1 Distribution Architecture Model #1: The Non-sharing Network

One extreme is the non-sharing model. Every producer deals directly with every customer or every retailer. This structure suffers from the high cost of providing all these links and connections between every participant, and each of these links may well be underutilized.

If there are n users, the number of two-way links will be $(n - 1) + (n - 2) + \dots + (n - n)$, approximately $n^2/2$. For example, if there are 1000 users, the number of two-way links would be 499,500. A variant to this model is a two-tier model (■ Fig. 12.7).³⁰ For example, everyone from Level 1 is directly connected with everyone else from Level 1. However, there are no connections among members from different levels. Several producers may have direct distribution relations to a set of retailers. The number of links will be $n_p \times n_r$. For example, if there are ten producers and 1000 retailers, there would be 10,000 distribution links.

12.3.1.2 Distribution Architecture Models #2: The Bus and the Ring

The other extreme is to have only one single distribution line that connects to everyone, running from one user to the next. Examples are a freight rail line that connects several towns or an Ethernet network that links the various computers and printers in an office. If there are 100 participants strung out along that line, there would be 99 links among them. This lowers the number of links, but it may also create congestion and vulnerability. If a single link fails,



■ Fig. 12.7 Distribution model #1 – Non-sharing model of producers to retailers

much of the entire system will go down. Forming a ring by connecting the two ends of the string reduces that danger somewhat, since the transmission could go in the opposite direction and still function. ■ Figure 12.8 shows such a ring of a fiber network around the continent of Africa, with drops to various countries.³¹

12.3.1.3 Distribution Model #3: The Tree and Branch

This topology contains one distributor and multiple consumers (■ Fig. 12.9).³² The flow of information or of products is one way; it starts with a wide pipe, which then splits into increasingly narrow pipes. This is the fundamental architecture of broadcast TV, cable TV, or newspaper distribution, and also of consumer electronics and other physical products. It is also the basic distribution mechanism for water, gas, and electricity.

The tree-and-branch architecture does not provide horizontal connections among users. Nor can a user connect to another producer except by joining another tree-and-branch system. And each producer must create its own distribution network. Thus this type of network is basically a one-way distribution medium.

12.3.1.4 Distribution Architecture Model #4: The Star

In a star distribution model, there is a “switching” node (S) (■ Fig. 12.10). Instead of every producer having an individualized distribution relation with every consumer, there is an intermediary in the middle that deals with multiple producers and serves numerous consumers.³³

30 Figure based on Ross, David Frederick. *Distribution, Planning and Control*. Norwell, MA: Kluwer Academic Publishers, 2004.

31 OAfrica. “Looking Back: Africa ONE (intended to be Africa’s first fibre ring).” May 21, 2011. Last accessed June 26, 2017. ► <http://www.oafrica.com/broadband/looking-back-africa-one-intended-as-africas-first-fibre-ring/>.

32 Graph based on Laubach, Mark. “Residential Area CATV Broadband Internet Technology.” *The Internet Protocol Journal* 1, no. 3 (December 1998): 13-27.

33 Ross, David Frederick. *Distribution Planning and Control*. (Norwell: Kluwer Academic Publishers, 2004), 80.



Fig. 12.8 Distribution model #2: The Bus or the Ring – Fiber network ring around Africa

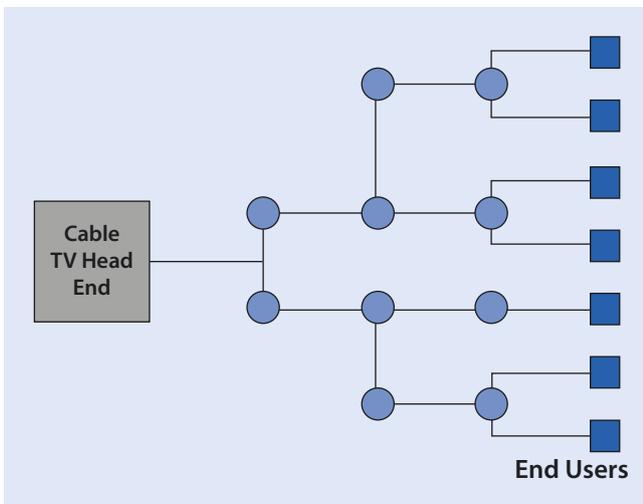


Fig. 12.9 Distribution model #3: tree and branch – Cable TV

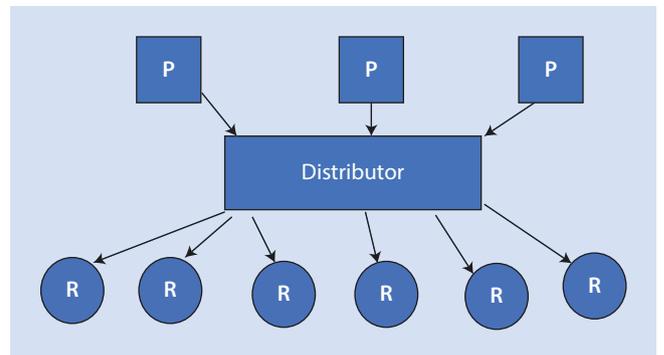
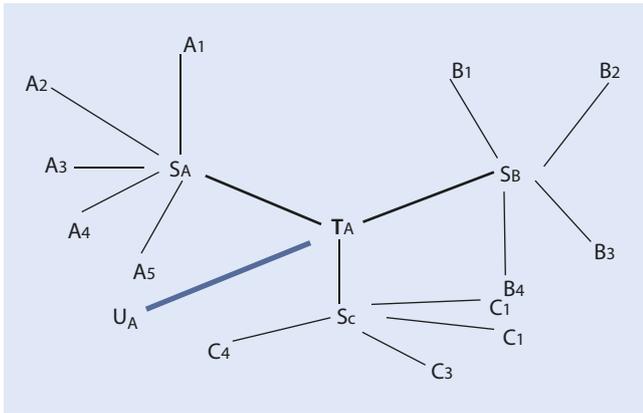


Fig. 12.10 Distribution model #4: Star distribution



■ Fig. 12.11 Multistar distribution

In a star distribution, the number of links with n participants is n . Thus, if there are 100 participants, the number of links is 100, plus an intermediary node. This is a vastly smaller number than what is required for model #1 (everyone directly connected to everyone), where it would be 4550. An extra user is much cheaper and easier to accommodate: adding a 101st user would require, in Model #1, as many as 100 new links, but with Model #4 (the star) only one new link. Model #1's incremental cost for users is not only high, but also rising, whereas it is low and constant for the star architecture model. Average cost, too, is rising for Model #1 but is declining for the star, Model #4. Or, put differently, an added user generates a large and growing net benefit for the star topology and a negligible and quite possible negative net benefit for Model #1.

The star, too, has potential problems. It is not quite as vulnerable as the party line shared network, which goes down for many of its users every time a single link fails. But the star architecture is still dependent on the reliability of the central node. Take it out and nobody connects to anybody. A second fundamental problem is that the users of the star may be widely dispersed geographically and each link to the central node could be long and expensive. To deal with this problem, stars are typically arranged in a multistar hierarchy, a “star of stars.” In ■ Fig. 12.11, T_A is a node of links from sub-stars S_A , S_B , and so on. T_A may be linked to a higher level node, U_A , which links the T level of nodes.

Examples of a multistar are telecom networks. They are also common in transportation. For example, in the airline industry several major airports are the central “hubs” and the individual routes are “spokes” to other cities. Thus, if air travelers wanted to go from Palermo, Italy, to Montpellier, France, they would most likely fly first to Rome (a hub city), thence to Paris (another hub), and then to Montpellier. Hubs can be international, serving other countries' airports too. Examples are Dubai, Miami, and Copenhagen.³⁴ While most

airlines rely on the hub-and-spoke architecture, others do not. Southwest Airlines (a very efficient airline) uses a point-to-point system, hauling people for relatively short distances of city-pairs with few connecting flights. In 2016, Southwest served 656 one-way, non-stop city pairs.

A hub and spoke system requires fewer links to connect the same number of points. It has a higher “load factor” because flows are concentrated in fewer links. On the other hand, it requires more switching (airport connections), which can be expensive and slow, and create vulnerable bottlenecks. If a snowstorm closes O'Hare airport in Chicago, dozens of other cities cannot be reached anymore.

A single-level star in transportation was, in its early pure design, the Fedex package distribution system. Every night planes from each city served by Fedex fly to Memphis, Tennessee, arriving close to each other in time, then unload their packages, which are then sorted in a central facility, and reloaded into the airplanes, which then fly back at dawn to their original departure cities. Hence a package would travel from Los Angeles to San Francisco via Memphis—a distance of 3500 miles instead of 350. The economic logic is that minimizing the distance traveled for a package was a secondary consideration. More important was to reduce the number of individual intercity flights and of sorting operations (i.e. of nodes). If there were 100 cities served by Fedex, its system required 100 flight routes and one node (Memphis), whereas a system of every-city-to-every city required 5049 flight routes (but no central node).

In a distribution system, the central node in a single stage star architecture is often called a wholesale distributor, and it would serve customers directly. For consumer products, examples would be an ecommerce site such as Amazon.com that offers products from all producers to all consumers. Rarely would there be exclusivity for any particular producer. In a two-stage architecture, there are two levels of nodes, those of wholesale distributors and those of retail distributors. (Usually the retailers have access to several wholesalers, which reduces the simplicity of the structure.)

12.3.1.5 Distribution Architecture Model # 5: The Mesh

A mesh network is a network topology in which each node relays or stores the product or data and co-operates in the distribution process (■ Fig. 12.12). The item moves (“hops”) along from node to node until it reaches its destination.^{35, 36} The best example of a mesh network is the internet itself, where information travels from one router to the next. In the physical world, mesh networks are less common. An example might be the informal system by which college stu-

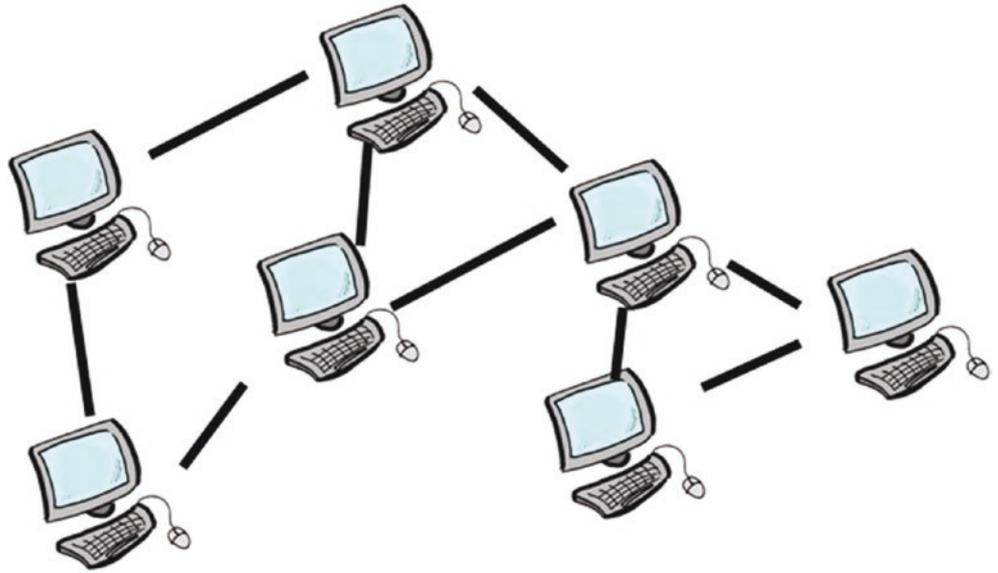
34 O'Kelly, M.E. and H.J. Miller. “The hub network design problem: a review and synthesis.” *Journal of Transport Geography*, 2 (1994): 31–40.

35 P2PFoundation. “Mesh Networks.” Last accessed June 26, 2017. ► http://wiki.p2pfoundation.net/Mesh_Networks.

36 Kay, R. “Mesh Networks.” *Computerworld*. August 10, 2009. Last accessed June 26, 2017.

► <http://www.computerworld.com/article/2550305/mobile-wireless/mesh-networks.html>.

Fig. 12.12 Distribution model #5: Mesh network



dents buy and resell textbooks for their courses or hold them for friends and siblings for future use. Electronic mesh networks became possible as transmission and storage dropped in price and enabled content distribution without the classic intermediaries.³⁷

When all goes well, peer-to-peer (P2P) systems scale well compared with traditional client-server (star) architectures. They utilize the uploading bandwidth of the clients (users) and are thus able to reduce the traffic load on the server (distributor) side. Users also contribute secondary storage, where the contents are cached to serve the later peers accessing the

same contents. Applications include live streaming and video on demand (VOD).³⁸

Mesh P2P distribution became popular because of its technological innovativeness, partly thanks to its community spirit and outlaw vibe. Owing to problems related to the technical robustness of the system, its vulnerabilities to hacking, and its frequent use for pirated (unlicensed) content that led to legal and technical counter-measures, usage again shifted away from P2P streaming toward more centralized distribution organized by service providers such as Netflix (video) or Spotify (audio).

12.3.2 Case Discussion

Distribution Network Architectures

- *Video: RTL – TV.* RTL receives video from numerous external content suppliers such as film studios, independent producers, film libraries, and network feeds, such as international sports events. It also creates its own content through internal sources such as editorial staff (e.g. news), in-house productions (e.g. TV shows), and films (its UFA production arm). RTL channels are beamed (uplinked) to satellites of various satellite operators, and from there are down-
- linked (broadcast) to cable head ends, TV stations, and to households directly. This kind of distribution architecture is a tree-and-branch structure.
- *Books: Penguin Random House.* A book moves from a printing plant to warehouses, from there to wholesalers, then to retailers, and to consumers. There is also a limited return distribution network for unsold books. This distribution architecture is a tree-and-branch structure.
- *Magazines: Gruner + Jahr.* The editorial staff and outside writers contribute articles. Advertisement copy is provided by advertising agencies. Printing and production is done by Be and Prinovis (a joint venture with the Springer publishing company), or by third-party printing plants. Subscribers receive it via the postal service. Retailers are reached by its own wholesaler in Germany and by independent wholesalers. This distribution architecture is a tree-and-branch structure.

37 Bauwens, M. "The Political Economy of Peer Production." *CTheory*. December 1, 2005. Last accessed June 26, 2017. ▶ <http://www.ctheory.net/articles.aspx?id=499>.

38 Shen, Z., J. Luo, R. Zimmermann and A. V. Vasilakos. "Peer-to-Peer Media Streaming: Insights and New Developments." *Proceedings of the IEEE 99*, no. 12 (December 2011): 2089–2109.

12.4 Analytical Tools for Distribution Management

Managers must understand the tool kit for analyzing distribution. These tools derive from multiple research disciplines. We will discuss them now.

12.4.1 Network Analysis Tools of Sociologists

Sociologists have developed social network analysis as the study of the structure of relationships.³⁹ Social network theorists believe that behavior is closely related to the ties that individuals have.⁴⁰ A social network is a type of map that illustrates how individuals (nodes) are linked to each other through relationships (links). Some nodes (people or organizations) are particularly central, or influential, with a high multiplier by connectivity to many others. “Social capital” refers to the value of one’s relationships and networks, and how one can leverage these connections to accomplish a goal.⁴¹ Measures known as “Eigenvector centrality” calculate such influence. This value is the sum of the centralities of the other players to which a player is connected. These centralities are measures of closeness and frequency of a relationship. A business application exists when financial institutions use such network analysis to chart the interactions of a customer and try to spot fraud when they encounter unexpected interactions. Law enforcement and anti-terrorist agencies do similar analyses. Social sites such as Facebook use it to recommend potential friends. Network operators, whether electronic or physical, can use it to optimize capacity structure of their networks. Another application is for marketers to identify “influentials” who have a multiplier effect, and to target them.

12.4.2 Network Analysis Tools of Lawyers: Essential Facilities

Lawyers focus on problems in distribution, such as bottlenecks and market power. With a bottleneck facility, one firm controls a link that is necessary to others, whether users or providers. In [Fig. 12.13](#), there are two competitors for transmission between C and B. But there is only one way from B to A. That link is a bottleneck, and whoever controls it

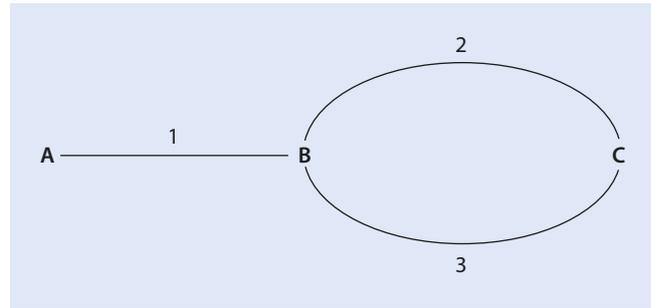


Fig. 12.13 Distribution bottlenecks

has market power.⁴² If it is held by one of the two competitors for the service A to C, then the other competitor has serious problems.

When there is a bottleneck link such as segment 1 and in an essential facility, it often becomes subject to regulation. An example is the regulation of the local telephone companies’ “last mile” of the network in order to assure access to users, content providers, and rival operators. This kind of analysis of the access by others to distribution, and of its pricing, will help the management of a distribution company stay out of legal and regulatory trouble.

12.4.3 Network Analysis Tools of Urban Planners: Location Theory

Transmission systems are affected by geography, population, and economic cost of distribution and transportation. This is the focus of analysis by urban planners. One major tool is location theory. Its premise is that distribution and transportation technology define market areas. A firm’s market area is the area over which a firm can underprice its competitors. The net price for the consumer is defined as the retail price charged by the retail store plus the transaction and travel costs incurred by consumers themselves. Now suppose that mobility cost becomes cheaper, for example by mobile phones reducing the “dead time” of travel. This would lead to larger market areas for a firm, because larger distance becomes a somewhat lower impediment for buyers.

How do cities develop, and why are some larger than others? One important factor is the location of businesses. A “central place” model of retailing (and of other economic activity) explains a hierarchical systems of urban patterns and provides a tool for market researchers to determine store locations ([Fig. 12.14](#)).⁴³ Every industry has a different location pattern, depending on its relative costs, economies of scale, and mobility cost.⁴⁴ For example, assume a region where three products are being sold: bookstores, computer

39 University of Twente. “Network Theory and Analysis.” Last accessed June 26, 2017. https://www.utwente.nl/en/bms/communication-theories/sorted-by-cluster/Communication%20Processes/Network%20Theory%20and%20analysis_also_within_organizations-1/.

40 Glanville, Jennifer L. “Voluntary Associations and Social Network Structure: Why Organizational Location and Type Are Important.” *Sociological Forum* 19, no. 3 (September 2004): 465–491.

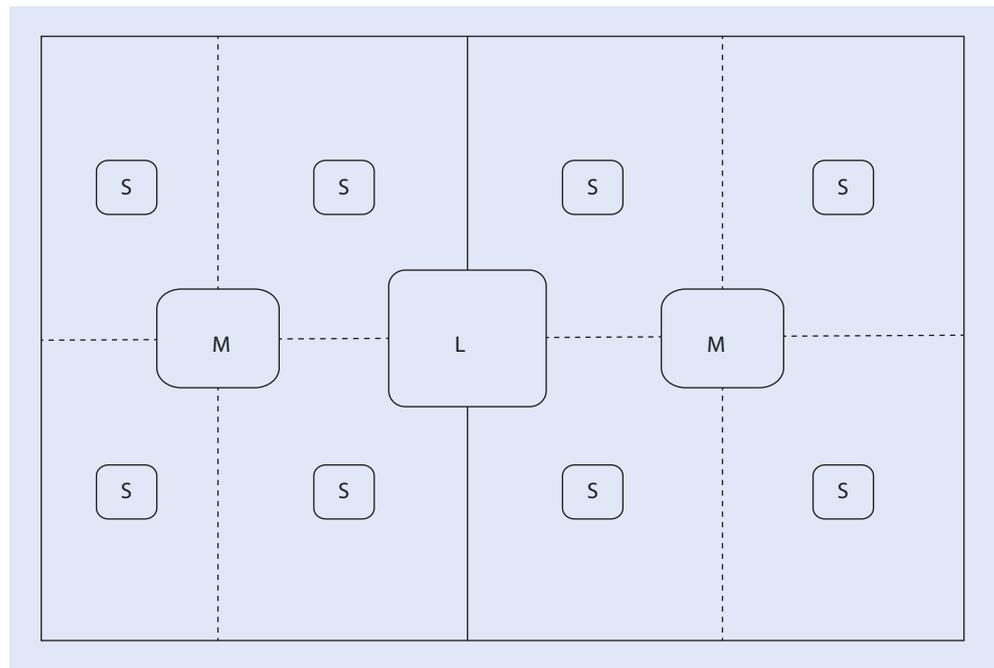
41 Miller, Gray. “What Is Social Network Theory.” *LoveToKnow*. December 5, 2008. Last accessed July 7, 2010. http://socialnetworking.lovetoknow.com/What_is_Social_Network_Theory.

42 Economides, Nicholas. “The Economics of Networks.” *International Journal of Industrial Organization* 14, no. 2 (1996): 23.

43 Based on image from O’Sullivan, Arthur. *Urban Economics*, 7th ed. (Boston: McGraw-Hill, 2009), 87.

44 O’Sullivan, Arthur. *Urban Economics*, 3rd ed. New York: Irwin McGraw Hill, 1996.

Fig. 12.14 Central place hierarchy



stores, and mobile phone stores. The initial distribution of population is uniform and the total population of the region is 80,000. For each product, per capita demand is the same throughout the region.

The three goods have different per capita demands and scale economies:⁴⁵

- Computer stores: scale economies are large relative to per capita demand, because of the high cost of inventory. Every computer store has an optimal scale size based on requiring a population of 80,000, so a single computer store will serve the entire region.
- Bookstores: scale economies are moderate relative to per capita demand, which is also moderate in size. Every bookstore requires a population of 20,000, and there will be four bookstores in the region.
- Mobile phone stores: scale economies are small because inventory can be just a small number of models, while customer service requirements are high. Every phone store requires a population of 5000, so there will be 16 phone stores in the region.

A single big computer store will locate at the center of the region to minimize transportation costs of customers, and computer store employees will locate near the store to reduce commuting costs. The population density near the computer store will increase. There will be enough demand to support more than one phone store and music store. Thus location L (large city) grows further in population. The two other bookstores will split the rest of the region into two market areas. Two more density areas develop, drawing employment and additional phone stores, and so on, in medium-sized cities (M).

The phone stores will also create market areas, though smaller and there will be yet a third tier of above-average population density (towns S).

Now suppose that the equilibrium number of phone stores decreases from 16 to 8 because the inventory requirements have risen while customer service has become automated and online. Four S towns then become economically unsustainable for such small-scale retailing. The equilibrium number of cities would decrease from 11 to seven, while the role of central cities is raised and that of smaller towns is lowered. Similarly, suppose that phones and computers are complementary goods, so that the typical consumers purchase computers and a phone on the same shopping trip. Computer and phone stores will then pair up to facilitate one-stop shopping. This, too, will add to the advantage of the big city, and disadvantage the second and third tiers. Some of these might be early entrants into online activities and capture a national market, but many others might be negatively affected by the same trend. If a physical shopping presence is a foundation for online retailing, and assuming no difference in labor cost, L and M would increase, if anything, their advantage.

On the residential end of location, people choose their home according to a basic trade-off of living space versus travel time to work.⁴⁶ Generally, cheaper space comes with a longer commute. That personal equilibrium defines a cityscape with a dense core and a suburban ring around the city. Now suppose that mobile communications lower the cost of commuting time by enabling people to use the time productively, and allowing them to increasingly work from home. As a result, the space-time tradeoff would shift and people would move further out.

45 O'Sullivan, Arthur. *Urban Economics*, 3rd. ed. New York: Irwin McGraw Hill, 1996.

46 O'Sullivan, Arthur. *Urban Economics*, 3rd. ed. New York: Irwin McGraw Hill, 1996.

Thus, on the production side, the lower cost of transportation and communication will often lead to a greater clustering of activities at the center. But on the residential side, the opposite is the case—a greater outmigration over the long run. In this fashion, the economics of distribution (of goods and of people) shapes city shapes, where we work, and where we live.

12.4.4 Network Analysis Tools of Electrical Engineering

To electrical engineers, network analysis addresses, among others, the question of how much information (bits) can be squeezed into a pipe, and how networks must be configured. A major building block is Shannon's Law (1948). Claude Shannon was a celebrated electrical engineering theorist at Bell Labs and MIT, often described as the "father of information theory." Shannon's Law shows the theoretical capacity of a communications channel, in bits per second, to be a function of bandwidth of the channel (measured in "Hertz"), and the ratio of the power of the signal (measured in "Watts"), and the interfering "noise" that the signal must overcome. The relation of the latter two is called the signal-to-noise ratio.

$$\text{Capacity (bps)} = \text{bandwidth (Hz)} \log_2 \left(1 + \frac{\text{signal power}}{\text{"signal noise"}} \right)$$

For example, how many bits can be sent over a typical telephone line? Suppose it is a voice quality phone line with a bandwidth of 4 kHz, and the signal's strength is 1000 Watts (a lot) but the channel's "noise" (unwanted hiss and hum) is 1 Watt in strength?

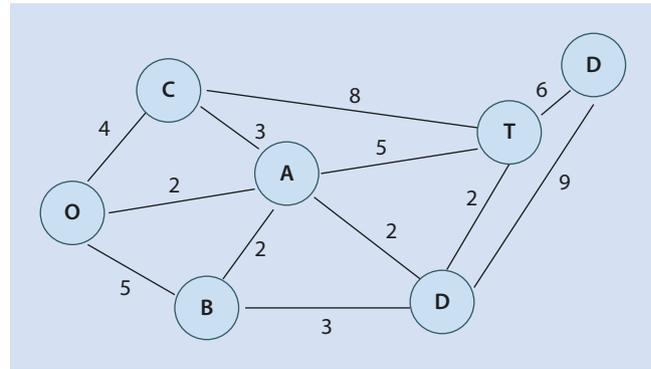
The equation tells us

$$\begin{aligned} C &= 4000 \text{ Hz} \times \log_2 \left[1 + \frac{1000 \text{ Watts}}{10 \text{ Watts}} \right] \\ &= 4000 \cdot \log_2 (100) \approx 4000 \cdot 4.6 = 18,400 \text{ bps} \end{aligned}$$

This translates into about 4.6 bits that could be transmitted per Hertz of bandwidth. (This, however, is the theoretical limit, under conditions of perfect engineering. The usual practical figure achieved by engineers is more around 3 bits per Hertz.)

Looking at the Shannon equation, we can make several observations:

- The stronger the signal power, and the lower the interference ("noise"), the more information can be put on a transmission link.
- Bandwidth is a substitute for signal power. One can get the same information transmitted with a less strong signal if one can use more bandwidth. This is especially important for mobile wireless applications, since lower power requirements mean a longer-lasting battery.



■ Fig. 12.15 OR model: newspaper distribution (schematic)

12.4.5 Network Analysis Tools of Statisticians: Operations Research

Operations research (OR) uses mathematics, statistics, and models to aid in the design of operations. OR derived from work on logistics in the military during World War II and afterwards. It includes techniques such as linear programming or queuing theory.

Examples of OR in media applications include:

- the optimal routing of distribution of newspapers to retailers;
- the design of a factory producing smartphones with an efficient flow of components;
- the construction of a telecommunications network with low congestion;
- the planning of the production schedule for a soap opera.

In this example of the distribution operations of a newspaper, the printing plant is located at O; other letters designate the locations of retailers (■ Fig. 12.15).⁴⁷ The numbers give the relative distances in miles between these nodes. One question to solve is what the shortest path is. Another question may be the minimum cost, if there are road tolls, for example. A third might be how to minimize time, if some roads experience congestion during rush hour.

12.4.5.1 Example: The Optimum Number of UPS Depots

The package delivery company UPS needs to design its local distribution system. Scale economies in production favor a small number of large stations. However, transportation costs favor a large number of small stations. Service quality (i.e. delivery time) is improved by many stations, which raises demand.

⁴⁷ Based on graph from Hiller, Frederick S. and Gerald J. Lieberman. *Introduction to Operations Research* (New York: McGraw-Hill, 1995), 355.

Assume that UPS has three options: it can build a system of either one, four, or ten local depot stations. It expects 100,000 deliveries per year, distributed evenly throughout the city. The total operating cost increases with the number of stations, from \$100,000 for one depot to \$400,000 for ten depots. The average operating cost equals the total operating cost divided by the number of deliveries. The delivery time drops as the number of depots rises. As delivery speed increases, UPS can charge more for its service (same day versus next-day quality level). But it is more expensive to operate ten depots.

From Table 12.1, we can conclude that the four-depot option is optimal in terms of profit maximization. But suppose that new communications technology enables UPS to deploy its trucks in the field more efficiently, reducing operating time per delivery by half, without adding operating cost? What is the impact?

The average delivery time decreases with the number of depots. The delivery time drops from ten hours for one depot to 2.5 hours for ten depots. Suppose that a delivery charge can be \$2 for a ten-hour delivery, and \$5 for a 2.5-hour delivery.⁴⁸ UPS could then charge \$4.50 for the one-station service (now at the five-hour quality), \$5 for four-station service, and \$6 for 1.25-hour service. The optimizing service level has now been brought down to one-depot only.

Given the above, how much would UPS be willing to pay for this mobility technology? The answer, from Table 12.2, is that UPS will pay up to the difference in profit. Without the mobility technology, it is $\$2.5 \times 100,000$. With mobility technology, it is $\$3.5 \times 100,000$. The difference, \$100,000, is the maximum UPS would invest in mobility technology per year. And indeed, to gain such a technology, the UPS company became an early leader in developing GPS ground navigation devices. Not only was it one of the earliest civilian user of GPS technology, but it also designed and produced GPS equipment itself and sold it to others. Once a supply of such equipment was assured by other sources, UPS reverted to its core business and sold its GPS operations to Garmin in 2003.

12.4.6 Network Analysis Tools of Operations Research: Queuing Theory

The planning of capacity in a distribution system needs to consider congestion. Waiting lines (queues) are formed when users seek a service that has limited capacity. Waiting lines for service are formed in many operations of distribution and production:

- customers in a movie box office lane;
- calls to a cellphone service representative;
- phone orders to an online merchant;
- installation orders for cable TV;
- packets in a transmission channel;
- music artists' time in a recording studio.

Table 12.1 Delivery service speed based on number of depots (schematic)

| | 1 depot | 4 depots | 10 depots |
|--|---------|----------|-----------|
| Total operating cost (\$) (100,000 deliveries) | 100,000 | 200,000 | 400,000 |
| Average operating cost per delivery (\$) | 1 | 2 | 4 |
| Delivery time (hours) | 10 | 5 | 2.5 |
| Average revenue per delivery (\$) (Price can rise with delivery speed) | 2 | 4.5 | 5 |
| Average profit per delivery (\$) | 1 | 2.5 | 1 |

Table 12.2 Delivery service speed based on number of depots with improved communication technology (schematic)

| | 1 depot | 4 depots | 10 depots |
|--|---------|----------|-----------|
| Total operating cost (\$) (100,000 deliveries) | 100,000 | 200,000 | 400,000 |
| Average operating cost per delivery (\$) | 1 | 2 | 4 |
| Delivery time (hours) | 5 | 2.5 | 1.25 |
| Average revenue per delivery (\$) | 4.5 | 5 | 6 |
| Average profit per delivery (\$) | 3.5 | 2.5 | 2 |

In each case, reducing wait times will increase service quality but will also raise operating costs. Reducing service quality (and thus increasing waiting time) will lower operating costs but will lead to a loss of users who will go elsewhere.

Queuing models approach the behavior of “arrivals” as a probabilistic process. The firm will look at the load factor. The load (or traffic) factor r is the ratio of arrival rate λ to service rate μ . As the load factor rises, the wait increases at an accelerated rate.⁴⁹ This can be rephrased as a question about how much of a capacity (i.e. service level) a firm must provide optimally. Figure 12.16 shows how an increased service level (added capacity) raises the cost of providing it (the diagonal line). At the same time, the company's revenues from serving customers as the service quality level rises, rising from zero (at Point A). At capacity level B, costs and benefits are equal, and net gains (the lower curve) move from negative to zero and beyond to positive. After a certain

48 O'Sullivan, Arthur. *Urban Economics*, 3rd. ed. New York: Irwin McGraw Hill, 1996.

49 Lesso, William G. "Operations research." *Access Science*. March 5, 2001. Last accessed June 26, 2017. ▶ <https://www.accessscience.com/content/operations-research/470410>.

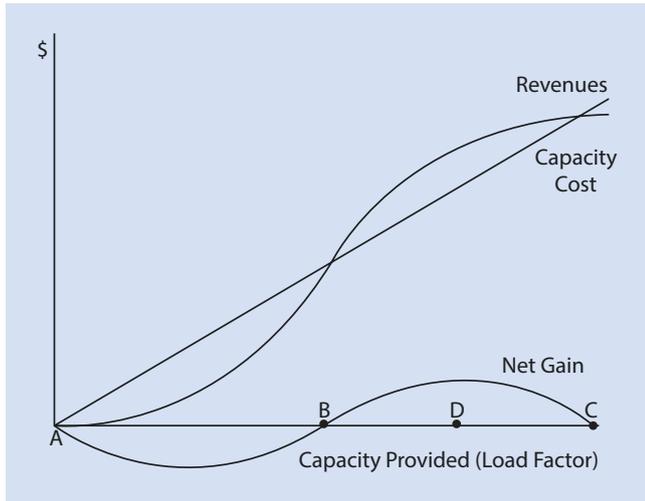


Fig. 12.16 Capacity cost, revenues, and net gain

point, however, the impact on additional business declines because customers are satisfied enough and the extra service level makes little difference to them. Eventually, at Point C, the added cost has eaten up all revenues. In-between B and C lies the optimal capacity D.

Example #1 Service Level

How many sales representation should a satellite TV company deploy in a sales booth in a shopping mall to sign up subscribers?

A satellite TV company is trying to sign up customers in a shopping mall. Customers will walk away whenever there are three customers ahead of them in line. Suppose that a service rep can serve ten customers per hour and that customers arrive at an average rate of seven per hour.⁵⁰ We then have then $\lambda = 7$, and $\mu = 10$. But customers do not arrive in a steady stream. Sometimes there will be a lot of people, and at other times no one at all shows up.

Typically, a Poisson probability distribution is used for the arrival rates. This is a probability distribution that characterizes discrete events occurring independently of one another in time. One can look up that probability for a λ or μ .

Is just one rep enough? Suppose the cost of one rep is \$200. Another cost item is the lost business due to customers not willing to wait. Suppose the value of a customer signed up is \$400. If the load factor is $r = 7/10$, the rep is busy 70% of the time. The probability that there will be no customers in the system is $P_0 = 1 - r = 30\%$ of the time. If a customer walks away whenever there are three customers ahead of them in the system, then the proportion of customers lost is:

$$1 - (P_0 + P_1 + P_2 + P_3)$$

Each of these probabilities is

$$P_n = 1 - \left(\frac{\lambda}{\mu} \right) \left(\frac{\lambda}{\mu} \right)^n - \text{the probability associated with a given number of customers in the system.}$$

In this case, the probability of having three people in the queue is $1 - (.3 + .21 + .147 + .1029) = .240$. That is, 24% of customers will be lost because the wait is too long.⁵¹ Now let us see the effect of adding a second rep.

The new load factor is

$$r = 7/2(10) = 35\%; \text{ instead of } 70\%.$$

The probability for n customers to be in the system is:

$P_0 = .4814$, and the other probabilities are

$$= P_1 = .3369$$

$$= P_2 = .1179$$

$$= P_3 = .0413$$

The lost business is $1 - (P_0 + P_1 + P_2 + P_3) = 0.0638$ which is a loss of 6.4%.

Thus the benefits of a second rep in terms of reduced loss of business is $24\% - 6.4\% = 17.6\%$. The cost of adding a second representative per day is \$200. Knowing that the average sign up rate is 0.3 and the average customer value is \$400, the expected value per customer handled is $\$400 \times .3 = \120 . The benefit is 17.6% of seven arriving customers/hr $\times 8$ hrs is $7 \times \$120 \times 8 \times 17.6\% = \1183 , which is much higher than the cost of \$200 in achieving it.

And what about adding a third service rep? This would reduce customer loss by 1%, for a benefit of \$67.50 versus a cost of \$200. So it will not be economical.

According to these numbers, the satellite TV firm should go ahead and add a second rep. Adding a third rep will not improve efficiency enough to justify the extra cost.

12.4.7 Network Analysis Tools of Operations Research: Quality of Service (QoS) Analysis

Quality of service (QoS) can be expressed in terms of the probability that a service will not be provided owing to oversaturation, a so-called “blocking probability.” This is similar to the waiting time discussed before, except that now, when the system is at capacity, it simply cuts off (blocks) the additional traffic.

The lower the network capacity, the more blocking there will be. To measure the QoS, the “Erlang Traffic Model” is used. β is the probability that a call will be lost, and it denotes the desired quality grade of service. Generally, a blocking probability of $\beta = 0.01$ is considered satisfactory in tele-

50 Schroeder, Roger. *Operations Management*. New York: McGraw-Hill, 1981.

51 Example from Schroeder, Roger. *Operations Management: Contemporary Concepts Cases*. New York: McGraw-Hill, 1981.

com networks. n is the number of lines, and it is the variable resource that is deployed. When there are n available channels and a traffic load of a , the probability that a call is blocked—that it arrives when all n servers are busy—is given by the Erlang formula.⁵²

$$B(n, a) = \frac{a^n / n!}{\sum_{i=0}^n a^i / i!} = \beta$$

By modifying the desired quality level β , one can calculate different numbers of lines required for a given amount of traffic.

There is a positive correlation between traffic quantity and the lines required to maintain a service quality. However, the percentage of extra lines required to maintain that quality grows slower than the growth of traffic, and this creates an advantage for size, that is, economies of scale.

Example

Consider planning a hotel switchboard connected to 780 internal phones. Each phone is being used 1.8 minutes per hour of traffic/hour (1.8 minutes is equivalent to approximately 30 “milli-Erlangs” (mE) per hour, a unit of traffic management). To guarantee that there will always be an outside line, one would need 780 outside lines, which would be expensive. Can there be fewer outside lines? How many lines are needed to connect the switchboard to the outside network, so that a hotel guest will not experience a blocked call owing to insufficient outside lines, more than $\beta = 2\%$ of the time? We are trying to determine the number of lines n . a is the traffic load: number of phones times the traffic per hour, in this case 780 lines times 1.8 minutes ($= 30$ mE) $= 23.4$ E. The computation becomes:

$$B(n, a) = \frac{a^n / n!}{\sum_{i=0}^n a^i / i!}$$

$$\beta = .02 = B(n, 23.4) = \frac{23.4^n / n!}{\sum_{i=0}^n 23.4^i / i!}$$

That equation is solved when $n = 38$. Thus to provide hotel guests with a service quality of less than 2% blocking, one needs 38 outside lines.

12.5 Network Management

These analytical tools and others are being used in network management, which is a set of actions to allow a network to operate efficiently and effectively. Underlying network management is the basic fact that the capacity of a distribution network is limited, and that to assure proper operations its use must be carefully deployed. This involves a scaling of the network with the matching of capacities of the various elements, the prioritization of certain types of traffic, quality control, cost consideration, pricing, and profit maximization.

A major issue is the architecture of the distribution network. Balancing the mix of the nodes and transport links—the distribution network architecture—is a management decision. An airline hierarchy has two or three tiers. A railroad hierarchy has three or four tiers. TV broadcasting has three. Cable TV content distribution has about six levels. If the cost of the transport links is high (relative to the cost of nodes), the manager will try to reduce them as much as possible. There will be fewer links, more nodes, and a greater hierarchy. For example, for rail networks track is very expensive to build and maintain, but switches are cheap relative to track. There would be a high level of hierarchy. Similarly, cable TV has expensive lines but relatively cheap neighborhood and curbside splitter nodes. Thus, where links are relatively expensive, the optimal distribution system will be multilayered and strongly hierarchical. In contrast, if the cost of transport links (per unit of traffic) is relatively cheap in comparison to the nodes, there will be fewer nodes and less of a hierarchy.

In electronic distribution, the trend of transmission has been to drop in price faster than for the switching node. In consequence, the architecture has been moving to longer electronic transport segments and to fewer and simpler nodes. The resulting network arrangement has been called the “dumb network”: a transport network of powerful pipes, but with limited nodes (intelligence) to route, steer, and control traffic.

A second task of network management is to match capacity with needs, to even out the load, and to prevent periods of substantial slack in the system followed by periods of congestion. Responses by managers of distribution systems to even out traffic load include:

- adding capacity by new construction or leases;
- prioritizing certain types of traffic;
- rerouting;
- setting usage caps (rationing);
- lowering the QoS;
- raising prices;
- permitting intercustomer trading.

For example, as smartphone use spreads, the mobile network capacities reach bottleneck conditions, with providers

52 Sharkey, William W. “Representation of Technology and Production.” In *Handbook of Telecommunications Economics*. Eds. Martin Cave, Sumit K. Majumdar, and Ingo Vogelsang. (New York: Elsevier, 2002), 180–226.

running out of bandwidth at certain times and locations. This slows down (and at times blocks) usage. Networks have therefore tried to reduce the traffic of the heaviest users. Studies show that 10% of users account for 90% of traffic. Mobile carriers instituted caps for data usage, both in order to price-differentiate between light and heavy users, and to reduce the latter's usage. The largest US telecom company, AT&T, started in 2012 to slow down the transmission speed of the top 5% of heaviest data users (consuming more than 1.5 GB) beyond a certain point. Similarly, ISPs such as AT&T or Comcast instituted a data cap on internet traffic. Comcast set a 250 GB monthly limit. When exceeded, the company quietly "throttled" that user's speed. AT&T's data cap for wireline ISP service was 150 GB per month in 2011. If exceeded three times, despite warning messages, the customer was billed \$10 for each 50 GB over the limit. In 2016, internet users were capped at 1 TB per month. Beyond this incurs a \$10 per 50 GB charge, up to \$100 a month.

Such restrictions led to regulatory actions. The regulators in Washington ordered companies to stop this practice, and a legal battle ensued which the FCC lost in 2010. Data caps and throttling are legal in the USA and Japan but fought over. In the EU, throttling is illegal.

A third issue of network management is service quality differentiation. Generally, a distribution network will offer a better service grade for a higher payment. This is true for airlines, the postal service, or internet service. It is partly based on the higher cost of delivering the higher quality, and it is also one way to price-discriminate against users with a low price elasticity. Providers of internet and other data transmission services have been offering their customers different grades of quality of service (QoS). QoS is important to some types of users who require, and are willing to pay for, a guaranteed service grade with certain transmission speed and reliability parameters for delay (latency), jitter, dropped packets, error rate, and so on. To assure such service guarantees, the network providers would, for example, reserve capacity for such users. Other users would get a service quality level based on "best effort," which means they were served by the network resources left over after the needs of the guaranteed QoS customers have been satisfied. Unless the network was over-providing by having excess capacity, those customers got a lower service grade. Of course, they also paid less.

A still more sensitive issue is whether, within a given quality and price level, some types of uses or users would get priority over others. The debate over this issue, as applied to the internet, is part of the battle over net neutrality. In 2015 the US government adopted net neutrality rules that mandated ISPs to treat all internet traffic the same, regardless of its origination, destination, content, or volume. In 2017, under a new FCC chairman, these regulations were abolished again. Net neutrality rules and principles will continue to be subject to tough legal and political battles. However, time sensitive traffic such as live voice calls or multiplayer video gaming have different latency needs than emails, where a slight delay is not as irritating as it is for a voice call. On the

other hand, email must be more reliable than video, where dropping a few bits is almost unnoticeable. One solution is to create "classes of data" that are given different treatment, such as prioritizing live and interactive human communication.

12.6 The Supply Chain: Logistics

We have analyzed the architecture of distribution. We now turn to a discussion of the several stages in a distribution chain.

These stages are:

- supply of inputs;
- production;
- wholesale distribution;
- retail distribution;
- user-to-user distribution.

Logistics deals with when, where, and how products and services reach producers, intermediaries, and consumers. Controlling the flow of inputs is known as inbound logistics, and that of outputs is outbound logistics.

There may also be a reverse logistics channel when consumers and retailers return products that are unsatisfactory or unsold.

Logistics operations may include some of these elements:⁵³

- providing the physical pipeline for finished products to reach the end consumer;
- designing the pipelines for inputs to reach the company and to be stored;
- designing and creating a network of warehouses for finished products;
- managing orders;
- transportation routing, scheduling, and fleet management;
- reverse logistics (returned goods);
- ability for retailers to coordinate their inventory levels with supply flow.

12.6.1 Third Party Distribution

Because logistics are increasingly complex, time sensitive, and global, firms often rely on third-party logistics providers.⁵⁴ These are distribution companies with cost advantages owing to scale and expertise. For example, UPS and FedEx provide tracking technology to make sure goods are always on the move. This is hard to replicate in-house in a cost-effective way. Even large companies such as Sony use specialized providers.

⁵³ Ross, David Frederick. *Distribution Planning and Control*. (Norwell: Kluwer Academic Publishers, 2004), 39.

⁵⁴ Rao, Bharat et al. "Building a World-class Logistics, Distribution and Electronic Commerce Infrastructure." *Electronic Markets* 9, no. 3 (November 26, 2010): 174–180.

An example of advantages of scale in physical distribution is cross-docking. In a cross-dock, goods arrive from multiple vendors at an intermediate warehouse facility, and the shipment from inbound trailers to outbound trailers bound for the appropriate destination can be done quickly and easily. Such cross-docking requires sophisticated information systems and tracking techniques, using electronics such as radio-frequency identification, so that each individual good is directed to the right destination in a timely fashion. This process greatly reduces inventory-holding costs and reduces the time for each good in the supply chain. To enable this requires a fairly big volume.

The choice between independent (third party) distribution and vertically integrated (in-house) distribution depends on the market concentration and the size of organizations that exist for a particular production stage. If there are only a few large producers, the distribution will likely be in-house. Examples are music, Hollywood films in their Golden Era, network TV, and local newspapers.

Conversely, if there are many producers, then the distribution is more likely to be by third parties, such as the system prevailing for books, magazines, and in today's Hollywood with its independent producers.

12.6.2 Inventory Control in Distribution Logistics

Of particular importance in distribution logistics is inventory control—the activities to optimize the amount of each item held in stock. Inventory functions as a buffer to respond to variations and uncertainty in demand and production.⁵⁵ A production line for laptops, for example, requires thousands of parts, and if it runs out of a single component the entire line comes to a screeching halt. Minimizing inventory costs can save a company millions of dollars that accrue as products are sitting around, accumulating storage fees, gathering dust, and becoming obsolete. On the other hand, large inventories save the costs of frequent reorders (replenishment), lost sales, the risk of supply shortage and rising prices, and dependencies on suppliers.⁵⁶ The firm must also consider the impact on customer good will. Interactions with marketing are important to inventory control: a firm must forecast demand and be ready to accommodate promotional activities that affect the need for inventory. Conversely, a high inventory may call for promotional activities such as price reductions and clearance sales.

An example of inventory management is the action taken by the IT firm Hewlett-Packard (HP). In 2000, it experienced a serious flash memory component shortage owing to shipping problems from China. As a result, it failed to meet the demand for its printers and lost many millions of dollars in

sales as well as damaging its reputation for reliability.⁵⁷ HP then developed a system it called procurement risk management.⁵⁸ HP also signed a contract with a distributor which guaranteed it would buy a minimum number of chips, at a fixed price.⁵⁹

A number of analytical techniques exist to optimize the flow of necessary inputs. Operations researchers calculate the economically optimal order quantity (EOQ). This is the optimal ordering size for a reorder.⁶⁰ The elements are the unit cost (UC) charged by supplier. There are also the reorder cost (RC) and the holding cost (HC). The optimal size for reorders is determined by the following formula⁶¹:

$$Q_o = \sqrt{\frac{2 \times RC \times D}{HC}}$$

Q_o = quantity to reorder

D = demand

RC = reorder cost

HC = holding cost of inputs

For example, a magazine printing company is concerned about its stock of paper, which is essential to its business. That paper costs \$8 a roll and it needs 8000 meters of paper a week. It operates 50 weeks a year. Each replenishment costs \$35 for administration and \$55 for delivery, while holding costs are estimated at 25% of value held in a year. Assuming no shortages are acceptable, what is the optimal inventory policy for the printing company?

$D = 8000 \times 50 = 400,000$ meters a year

UC = \$8 a unit

RC = 35 + 55 = \$90 an order

HC = 0.25 × 8 = \$2 a meter

$$Q_o = Q_o = \sqrt{\frac{2 \times RC \times D}{HC}} = \sqrt{\frac{2 \times 90 \times 400,000}{2}} = 6000$$

The number of annual orders then is 400,000/6000 = 66.67, and the optimal time between orders is

$$T_o = \frac{Q_o}{D} = \frac{6000}{400,000} = 0.015 \text{ years} = 5.475 \text{ days}$$

In other words, it is optimal to reorder and be supplied every 5.5 days, that is, about once a week. If the holding costs were lower, at \$1 rather than \$2, the optimal reorder period would

55 Waters, C.D.J. *Inventory Control and Management*. (New York: John Wiley & Sons, 1992), 7.

56 Silver, E. A. "Operations Research in Inventory Management: A review and critique." *Operations Research* 29, no. 4 (August 1981): 628–645.

57 Global Logistics & Supply Chain Strategies. "HP Invents New Framework for Managing Supply Chain Risk." December 2005. Last accessed June 26, 2017. ► <http://www.supplychainbrain.com/content/research-analysis/supply-chain-innovation-awards/single-article-page/article/hp-invents-new-framework-for-managing-supply-chain-risk-1/>.

58 Global Logistics & Supply Chain Strategies. "HP Invents New Framework for Managing Supply Chain Risk." December 2005. Last accessed June 26, 2017. ► <http://www.supplychainbrain.com/content/research-analysis/supply-chain-innovation-awards/single-article-page/article/hp-invents-new-framework-for-managing-supply-chain-risk-1/>.

59 Global Logistics & Supply Chain Strategies. "HP Invents New Framework for Managing Supply Chain Risk." December 2005. Last accessed June 26, 2017. ► <http://www.supplychainbrain.com/content/research-analysis/supply-chain-innovation-awards/single-article-page/article/hp-invents-new-framework-for-managing-supply-chain-risk-1/>.

60 Assume the lead time for orders is equal to zero.

61 Waters, C.D.J. *Inventory Control and Management*. (New York: John Wiley & Sons, 1992), 32, 40–41.

be longer, 7.75 days. The same methodology can be used for a book publisher's optimization problem on how many books to print and hold in stock, given the traditional batch aspect of printing.

12.6.2.1 Just in Time

Just in Time (JIT) is an inventory strategy to reduce inventory costs in production. Traditionally, a producer held a large inventory of parts to be on the safe side, to avoid running out of suppliers or parts. In contrast, JIT substitutes continuous flow delivery from suppliers further down the supply chain. This shifts the cost of maintaining an inventory onto these suppliers. In effect, it outsources the maintenance of inventory. This results in a somewhat higher price per unit for such supply (all other factors equal) but usually at a lower overall cost since fewer units need to be held in inventory. To have a well-functioning JIT system requires continued communication of producer and supplier in real time. It requires by both the ability to overcome an unexpected supply problem or change. The producer must have confidence in the quality of the suppliers' inputs since there is no time to return the items. The supplier, in turn, should not be surprised by sudden changes in the order quantities. All this requires the establishment of long-term relations among those adjacent to each other in the supply and distribution chain.

12.6.2.2 EDI

The process of logistics has been enormously helped by information technology. Electronic data interchange (EDI) is the exchange of electronic data and documents between computers according to a standardized format that can be understood by the other's computers. The standards and specifications of an EDI system are set by large companies, by industry associations, key suppliers, and the Data Interchange Standards Association. EDI can

- reduce inventory, which accounts for 5–10% of net tangible assets in the USA;
- speed up supply;
- smooth production runs;
- lower procurement prices;
- support JIT;
- Simplify import/export.

For example, General Electric moved 1400 of its suppliers to a Total Procurement Network, and claimed that this reduced cycle times up to 50%, procurement cost by 30%, and material costs by 20%. Despite these savings, it also improved relationships with suppliers.

Traditional EDI was based on closed networks set up and controlled by large companies with its suppliers and dealers, or by industry groups. It focused on highly repetitive B2B transactions. The various EDI systems were incompatible within an industry and across industries. Next, EDI specifications were set more broadly by industry associations and key companies for their suppliers/dealers. The main standards are EDIFACT in Europe, ANSI X.12 in North America, and

GS1EDI more generally. Soon, EDI migrated to the internet, with low price EDI software packages available.

To summarize, the supply logistics chain, while largely invisible to consumers, is complicated and a lot is riding on it. If it does not function well, the firm might hit sudden production bottlenecks and miss delivery dates. This is especially true for mass production. Conversely, if the firm experiences uncertainties in its supply chain it will end up overstocking its inputs, and this will be reflected in its cost and prices. On outbound logistics, when a firm does not organize its logistics well it will end up disappointing its customers. When these customers engage in risk-minimization strategies, they will diversify their own suppliers and shift orders to them. Or in the case of consumers, some will be permanently lost.

The supply chain must be managed as one overall process rather than through dozens of independent functions and transaction systems.⁶² Communication with the participants up and down the supply chain is key to generate confidence, meet targets, and deal with unanticipated events. There must be an active exchange of information to create demand forecasts, inventory levels, capacity utilization, production schedules, delivery dates, and so on. Such communication is also an opportunity for distributors to stay in touch with major customers.

12.6.2.3 Push Versus Pull Distribution

There are two major forms of production and distribution. In product push mode, production and distribution decisions are based on forecasts and strategies.⁶³ In a consumer pull supply chain, on the other hand, production and distribution are demand-driven and based on true customer orders rather than expectations. In a pure pull system, therefore, the firm produces only to-order and holds no inventory. The largest book retail chain in the USA, Barnes and Noble, operated with a classic push supply chain. It stocks the books it thinks will sell. In contrast, Amazon.com was a pure pull system, with no warehouses or inventory. The large book wholesaler Ingram, located nearby in Seattle, and the various publishers fulfilled Amazon's customer orders. It was they who kept the inventory. This, however, did not work well for either. During periods of peak demand, such as the Christmas shopping season, Amazon could not meet supply fast enough. In consequence, Amazon established several warehouses around the country to have a buffer for orders for the most popular titles. Amazon thus moved to a mixed model, push-pull. Similarly, Barnes and Noble had to get highly specialized titles from the publisher as special orders. Product push fits best for products that have a track record for long-term forecasts or where a major marketing campaign is planned.

62 Rigby, Darrell K. "Management Tools & Trends 2013." *Bain & Company*. May 8, 2013. Last accessed June 26, 2017. ► <http://www.bain.com/publications/articles/management-tools-and-trends-2013.aspx>.

63 Simchi-Levi, David and Edith Simchi-Levi. "The Effect Of E-Business on Supply Chain Strategy." *Massachusetts Institute of Technology*, Working Paper Series. January 4, 2003. Last accessed June 17, 2017. ► <https://dspace.mit.edu/bitstream/handle/1721.1/102732/esd-wp-2003-01.04.pdf>.

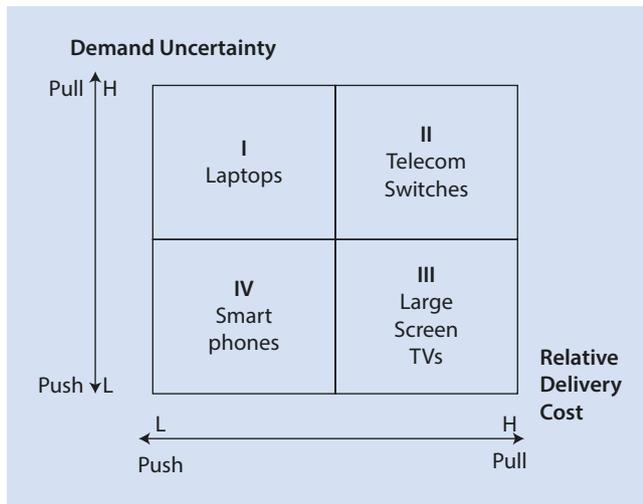


Fig. 12.17 Push and pull in IT industries

A mixed system exists for many media operations. Magazines and newspapers use both push and pull. Magazines ordered by subscription are pull, since the copies are produced and sent out only when customers subscribe. On the other hand, the consumer magazines sold in retail stores operate on a push model. Since so many of them will never be sold and are then returned by the retailer to the publisher for refund, printing and shipping them is risky, and this is reflected in their price relative to subscriptions.

A second factor besides the uncertainty of demand is the cost of delivery. Where that cost is high, neither the producers, nor wholesaler or retailer, is eager to make the investment of shipping the product ahead of demand. Figure 12.17 shows how two factors determine pull–push arrangements. The axes denote distribution cost and demand uncertainty. Where both demand uncertainty and distribution cost are high (Quadrant II), such as for building heavy equipment for mobile cellphone sites that can operate in arctic conditions, the pull model is favored.

Where both factors are low (Quadrant IV), for example for already bestselling smartphones such as the Apple iPhone, the push model is favored. In other cases, demand uncertainty is high and shipping is costly (Quadrant II). Another example is telecom central office switches. The approach needs to be to lower uncertainty by seeking contracts with an automatic replacement cycle. Alternatively, the company should use the pull model. Where the two factors move in opposite directions a mixed strategy will be used. For new laptops (high uncertainty, low delivery cost, Quadrant I), a marketing campaign will try to reduce uncertainty. For large-screen TV sets, where demand is relatively high but so is delivery cost, the company should improve its logistics system so as to speed up its delivery time.

The pull versus push decision is one that must be made at each stage of the supply chain. Rarely will it be uniform across the company's entire operations. Each company must decide where its boundary between pull and push lies, and for what types of activities it will wait for the customers and

for which it will anticipate them. The boundary for the personal computer (PC) maker Dell is at the assembly stage. Dell waits for a customer order before it makes the computer (pull). But it already has the components in stock (push) or has a very fast, JIT access to them. For Amazon.com, the boundary for bestsellers is at the distribution center where it keeps books ready to be shipped. For other books Amazon has no stock but passes the order to the manufacturer/publisher. The closer the pull–push boundary is to the early parts of the supply chain, the longer will be the time from receiving a buyer's order until the buyer receives the product. Locating the boundary at the assembly stage, in the way that Dell does, will not work well for products with long assembly or transportation lead times, or where a customer's instant gratification is part of the product.⁶⁴

The push part of a push–pull process is focused on cost minimization—to build a competitive product and encourage retailers to stock it. In contrast, the pull segment is focused on service levels—fast response.

E-commerce allows companies to shift toward a consumer pull, because demand can be more accurately observed and gauged, and the company can more rapidly build or procure, and squeeze a faster turnover of whatever stock it might have. The move from physical to electronic distribution and products makes a pull model easier, since there is no need for inventory. Examples are VOD for home video, streaming for recorded music, and print on demand (POD) or ebooks for books.

12.7 Wholesale Distribution

12.7.1 The Function of Wholesale Distribution

The wholesale stage of distribution is arguably the central element in the distribution chain. It is the link between production and retailing. In a network architecture, the classic wholesale function is the set of distribution links and nodes element between the producer (or several producers) and the retailers.

Typically, a wholesaler will distribute the goods and creations of multiple and competing producers to multiple and competing retailers. Conversely, both producers and retailers may also transact with competing wholesalers. But there are also various forms of exclusivity arrangements at each level.

Wholesalers fill numerous functions:⁶⁵

- selling to retailers and promoting the product;
- maintaining an assortments of products, often from multiple producers;

⁶⁴ Simchi-Levi, David and Edith Simchi-Levi. "The Effect Of E-Business on Supply Chain Strategy." *Massachusetts Institute of Technology, Working Paper Series*. January 4, 2003. Last accessed June 17, 2017. ▶ <https://dspace.mit.edu/bitstream/handle/1721.1/102732/esd-wp-2003-01.04.pdf>.

⁶⁵ Ross, David Frederick. *Distribution Planning and Control*. (Norwell, MA: Kluwer Academic Publishers, 2004), 67.

- bulk breaking of large shipments from producers to smaller quantities;
- value-added processing;
- physical transportation and shipping;
- warehousing;
- provision of marketing information;
- order processing;
- logistics services;
- assumption of ownership and risk;
- managing the import transactions and paperwork;
- managing exports especially for smaller producers;
- aggregation of the flow of orders, and flow management;
- aggregation of the flow of payments;
- compensation of various parties;
- a role in the financing of production;
- a role in the financing of retailers.

Of course, not all wholesalers engage in all of these functions, and some of them may also be undertaken by the producers or retailers, or not at all. Different product lines have different practices. Unlike the retailing and production stages which tend to have well-defined core responsibilities, the wholesale stage is an aggregate of intermediary functions that varies greatly. Typically, too, wholesaling does not have the visibility of retailers and of brand name producers. (Media industries are an exception.) In consequence, the role of wholesaling is often underappreciated or even denigrated as one of an unproductive “middleman” that one must strive to cut out. Yet the very fact that this wholesale stage exists in almost every product line, industry, and country strongly suggests the presence of a value-added function that is economically logical and operationally essential.

There are several generic types of wholesale distributors:⁶⁶

- Merchant wholesalers:
 - take title to good and resell it.
- Brokers
 - facilitators of transactions between producers and retailers;
 - assist in price, product, and delivery negotiations.
- Mail-order and B2B ecommerce wholesalers
 - sales of products to retailers from catalog and website, without taking possession of products.
- Agents
 - producers’ sales representatives;
 - retailer’s purchasing agents;
 - sellers on commission.
- Manufacturers’ direct distribution to retailers
- Producers’ co-operatives:
 - assemble products from co-op members, such as farmers or software writers, to sell.
- Rack jobbers:
 - responsible for delivery, product setup and display, item rotation, inventory management for retail establishments;

- retain title to the inventory, billing retailer for goods sold;
- examples: toys, paperback books.

We will now discuss wholesale distribution for several major media industries.

12.7.2 Film Wholesale Distributors

12.7.2.1 Film Distributors: General

One can say that the entire medium of film originated as a way to deal with the high cost of distributing the content of another medium, namely that of theater. The high costs of live theater distribution created incentives for technology for mass distribution of such content. Film provided the technology. Film distribution costs are about .005 cents per second per viewer, which is only 1% of the distribution costs of live commercial theater, which has to distribute the content every night to a modest-size audience using live actors, ushers, lighting technicians, and possibly musicians. Thus film emerged. Soon, the entire industry revolved around a handful of studios which produced, exhibited (i.e. retailed), and wholesale-distributed to retailers.

On the business end, what is it that film distributors do? Their functions are numerous:

- promotion and advertising of films;
- physical delivery of a film to theaters;
- often, exhibition in own theaters;
- negotiations with domestic and foreign outlets such as film theaters, TV networks, and online video providers;
- delivery of film to TV and cable networks;
- storage of film on website for downloading and streaming;
- transmission of film to third-party websites for downloading and streaming;
- production of home video and delivery to video stores;
- collection of rentals and license fee payments from the various retail channels;
- accounting for revenues and distribution of payments to the various participants;
- licensing of related merchandise;
- protection of the copyrights.

The major film distributors also frequently produce their own films and subsequently distribute them. They often provide financing to independent productions. As a condition for assuming part of the financial risk they have a major voice in shaping these films in terms of content and talent. A distribution agreement between a producer and a distribution can take three major forms:⁶⁷

66 Ross, David Frederick. *Distribution Planning and Control*. (Norwell, MA: Kluwer Academic Publishers, 2004), 67.

67 Tyson, Jeff. “How Movie Distribution Works.” *How Stuff Works*. September 18, 2000. Last accessed June 26, 2017. ▶ <http://entertainment.howstuffworks.com/movie-distribution.htm>.

Table 12.3 Market shares of film distributors (USA, 1995–2016)

| | Distributor | Movies | Total box office (mil) | Tickets (mil) | Box office/film (mil) | Tickets/film (mil) | Share (%) |
|----|--|--------|------------------------|---------------|-----------------------|--------------------|-----------|
| 1 | Walt Disney | 532 | \$30,398 | 4657 | \$57.14 | 8.75 | 15.22 |
| 2 | Warner Brothers (Time Warner/AT&T) | 678 | \$29,992 | 4517 | \$44.24 | 6.66 | 15.02 |
| 3 | Sony Pictures | 643 | \$24,708 | 3814 | \$38.43 | 5.93 | 12.37 |
| 4 | 20th Century Fox (Fox) ^a | 470 | \$23,197 | 3505 | \$49.36 | 7.46 | 11.62 |
| 5 | Universal (Comcast) | 436 | \$22,719 | 3421 | \$52.11 | 7.85 | 11.38 |
| 6 | Paramount Pictures (Viacom) | 444 | \$22,323 | 3441 | \$50.28 | 7.75 | 11.18 |
| 7 | Lionsgate | 344 | \$7489 | 987 | \$21.77 | 2.87 | 3.75 |
| 8 | New Line (Time Warner 2001) | 205 | \$6193 | 1116 | \$30.21 | 5.44 | 3.10 |
| 9 | Dreamworks SKG (Viacom 2006) | 78 | \$4279 | 760 | \$54.86 | 9.74 | 2.14 |
| 10 | Miramax (Disney 1993, Al Jazeera 2016) | 383 | \$3841 | 715 | \$10.03 | 1.87 | 1.92 |
| 11 | MGM (Sony 2004) | 229 | \$3510 | 642 | \$15.33 | 2.80 | 1.76 |
| 12 | Fox Searchlight (Fox) | 198 | \$2311 | 333 | \$11.67 | 1.68 | 1.16 |
| 13 | Weinstein Co. | 171 | \$2111 | 269 | \$12.35 | 1.57 | 1.06 |

Chart compiled using information from Box Office Mojo. "Studio Market Share." 2016. Last accessed June 27, 2017. ► <http://www.boxofficemojo.com/studio/?view=parent&view2=yearly&yr=2015&p=.htm>

^aAcquisition by Disney pending 2018.

- Profit or revenue sharing. The distributor receives a share of the economic benefits, that is participates in the risk. Usually, the distributor's expenses are recovered first.
- Leasing. The distributor agrees to pay a fixed amount for the rights to distribute the film.
- Purchase. The distributor acquires all rights in the film.

The first option is most prevalent. In return for its activities in support of the film, a distributor collects money at several stages. A distributor charges a film's budget and revenues on several levels, as discussed in ► Chap. 13 Accounting in Media and Information Firms.

- Distribution costs for the actual out-of-pocket expenses. These include the expenses for copies, dubbing, advertising, taxes, customs, freight and transport, and union residuals.
- Distribution fees. This is a service fee for providing managerial overhead and toward the studio's profit. It generally amounts to either 15% of the production budget,⁶⁸ or a percentage of adjusted gross receipts, which are the various revenue streams after deduction of sales taxes and similar taxes. Of adjusted gross box office receipts, the major studio distributors charge a fee of about 30% in North America, and slightly higher rates for international distribution and for foreign films in the US.⁶⁹

Who are those major distributors? After an early tumultuous stage in the early twentieth century, a handful of film companies emerged that still dominate the Hollywood distribution (► Table 12.3): Universal, Paramount, Columbia/United Artists (now Sony), Warner Brothers, and 20th Century Fox. They were joined in the 1930s by Disney. RKO and MGM fell by the wayside. This has left six firms for over 80 years now.

In the USA, vertical integration of production/distribution with exhibition was an issue of contention particularly in the 1930s and 1940s. Basically, the major studios/distributors did most of the exhibition in their own theaters. The producers and wholesalers were also the retailers. Independent theaters and film producers complained bitterly about the unfair competition of being excluded from top theaters, or being denied popular films for showing. The US government agreed and brought an anti-trust action that led a decision by the US Supreme Court in *U.S. v. Paramount (1948)* that required the studios to sell their movie theaters.⁷⁰ Similar controversies surrounded the vertical integration of film studios and TV networks. For a long time, this was outlawed in the USA through anti-trust law interpretations and various regulations such as the financial interest and syndication rules (1970–1993), but these restrictions were gradually

68 Epstein, Edward Jay. *The Big Picture, The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005.

69 Blake, A. Brandon. "Striking a Deal in the Global Market." *Blake & Wang*. 2001. Last accessed June 27, 2017. ► http://www.blakewang.com/international_lawyer.htm.

70 Several other countries also took a look at competitive practices for film distribution. For example, in 1999, the Italian Anti-Trust Authority investigated allegations that major film distributors in Hollywood and throughout Italy violated the Italian anti-trust law.

dropped and today five of the six Hollywood majors are vertically integrated with TV networks, with Sony being the exception.

Before a film opens, the distributors must create an audience for it by marketing through advertising and other promotion. For a Hollywood movie, this averages about \$40 million per film just on advertising.⁷¹ Because of the financial and organizational effort, the distributors must be selective. Many filmmakers say that making a movie, hard as it is, is not nearly as difficult as getting it distributed.

Within the USA, the major distributors also handle films produced by independent and foreign filmmakers. Distribution is a major problem for independent film productions, which has grown over the years. In 2015 there were 4106 feature length submissions to the Sundance film festival, in Park City, Utah.⁷² To serve independent filmmakers there are also independent distribution companies that concentrate on niche or low budget films. But they, too, are choosy. Independent film producers can also self-distribute their movies, but that is not easy in financial or logistic terms.⁷³ Alternative arrangements include independent sales agents, (“producers’ reps”), who function mostly on a commission basis, with the rep getting 5–10% of a film’s net proceeds.

Theatrical distribution of a major Hollywood film is expensive and requires much planning. One decision is to pick the opening date. It needs to fit the season and avoid clashing with competing releases that vie for the same target audience or with major sports events championship events. (On the other hand, a weekend with a big sports event might fit the release of films that appeal to viewers who are uninterested in sports and seek an escape.) Advertising costs also vary. In some countries where political campaigns are waged on commercial TV, in the weeks preceding an election the spike in demand for TV spots for political advertisements raises the price of TV time and thus the cost of film marketing.

Distributors must also stagger their films according to their ratings. If all their films on a weekend had an R rating, they would lose family attendance. Though kids aged 12 to 20 make up only 16% of the general population, they account for 27% of the movie audience. Distribution companies therefore often require filmmakers and producers to earn a rating less restrictive than R or NC-17. This can create tension with the creatives, who often gain peer and critical respect through their work on edgy films.

Next, the film distributors must line up theaters for a national release. In the USA, this takes about 1500 to 3500

theaters (and a proportionally similar number in other countries). Films are then promoted by a national advertising campaigns on TV, internet, and print media. The attention of critics and word of mouth are at their peak.

A second major way to distribute films is through the rental or sale of physical or electronic copies. The Hollywood studios initially totally underestimated the vast revenue potential of home video and fought it. Later, such videos became a major source of profits. A film’s home video version is usually released four to six months after the film’s end of the theatrical run,⁷⁴ though that window has been shortening. The studios distributors spend relatively little on the marketing of most videos and the stars rarely publicize them. Most of the public awareness of such a release is the afterglow of the film’s original marketing push. And because that buzz depreciates over time there is an incentive to get movies into home video and VOD distribution relatively quickly.

Retailers such as Wal-Mart and Best Buy will stock and promote only a handful of new DVDs, focusing on blockbusters. To differentiate DVDs from the theatrical or TV version, the studio distributors usually include additional material such as deleted scenes, commentaries by the director and stars, and various public relations (PR) stuffing. Online, there are fewer such extras. Amazon Prime Video offers some only for an extra payment (rent or buy).

Adding supplementary materials can also be done to older films, and they can then be promoted as “special editions.” Distributors also bundle TV series by releasing an entire season of episodes.

To export a film abroad, the distributors ship the prints or hard drives after dubbing or subtitling them with other languages, plus some editing to conform with local rules on content. For the Disney film *Gone in 60 Seconds*, for example, the cost of foreign prints, shipping, translations, and customs clearance for Disney’s distribution arm Buena Vista was \$12.7 million.⁷⁵

The actual physical shipment is often subcontracted to third-party providers.

12.7.2.2 Digital Film Distribution

For over a century, the exhibition technology of film retail was fairly static: a strip of celluloid, with sprockets for moving the strip, and a strong light projecting through it and focused by a lens. What was later added was sound and color. One reason was that any change had to be adopted by tens of thousands of theaters, which was costly, unwieldy, and slow.

71 Epstein, Edward Jay. *The Big Picture, The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005.

72 Carr, David. “New York ‘Little’ Films Grow Big.” *The New York Times*, May 12, 2005. Last accessed June 17, 2017. ▶ <http://www.nytimes.com/2005/05/12/movies/new-york-little-films-grow-big.html>.

73 Marich, Robert. *Marketing to Moviegoers: Independent Distributors*. Burlington, MA: Elsevier Focal Press, 2005.

74 Epstein, Edward Jay. *The Big Picture, The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005.

75 Epstein, Edward Jay. *The Big Picture, The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005.

This changed with twenty-first-century electronics. The storage medium shifted from chemical and mechanical to electronic and computer-rendered. “Films” became hard drives. “Projectors” became electronic display machines that can operate at several frame rates and aspect ratios, and can even be controlled remotely. Traditional 35 mm film projectors have not entirely disappeared, since theaters often keep one or two for occasional airings of classic and independent movies. In 2008, the feature film processed for film prints was 13 billion feet worldwide. Just four years later, this had come down to 3.5 billion. The major photo film manufacturers collapsed: Eastman Kodak went bankrupt in 2012 and closed operations. Its major competitor, Fujifilm, announced it would stop making film for movies. In 2012, 20th Century Fox announced that it would release its movies in the future only in a “digital format.” Technicolor closed its film lab in Glendale, California, and its Pinewood film lab in Britain.

Shipping a hard drive is a more efficient way to more content than film. But it is not cheap, either, up to \$2000 owing to security and insurance. Most cinemas use a system called Digital Cinema Package (DCP), which is a USB pen (with a digital version of the film; the files are usually JPEG2000 and are either 2K or 4K in resolution) that is shipped inside a case. After receiving the DCP, the theaters then upload the data via a CRU port onto their main server. To create accountability each pen has a certain number of licenses on it. A DCP is a file that requires activation from a license. The cinema signs for the DCP, and then the projectionist is given the license activation code to allow the content to be played. The key to open the files is sent in an encrypted mail to the theaters. This is a coded file made specifically for any specific theater, telling their computer which screen it can play the film in and also the specific time period within which it can be played.⁷⁶ In all, almost all of 40,000 screens in the USA have converted to digital.^{77, 78}

Yet this is not the end of the story for transitioning from a physical distribution chain to an electronic one. The next step is delivering the film to the theater electronically. Theaters can install satellite antennas to receive movies. This lowers the cost of delivering a film to less than \$100. Full electronic distribution via streaming or downloading—from the distributor to the projector or screen—makes distribu-

tors nervous owing to the potential for piracy. But security can be provided through effective encryption. It also makes theater chains nervous: once direct electronic distribution is available to the theater, why not leapfrog the theater and deliver directly to the home? This makes business sense where a premium price can be charged. In 2014, Netflix and Sony enabled viewers to watch certain movies on-demand with 4K Ultra-HD televisions at the same time as theatrical exhibition. Oscar-winning director Christopher Nolan observed: “the vast majority of theaters will be showing something that frankly isn’t much better than what you can get in your house.”

One must distinguish digital production from digital storage and digital distribution. The three are related but independent of each other. On the production side, the trend toward digitalization has been highly controversial. Famous directors (Clint Eastwood, Christopher Nolan, Martin Scorsese, Steven Spielberg, and Quentin Tarantino) rhapsodized about celluloid’s texture, visual effects, even smell. Yet the discussion compared digital with pristine celluloid film, which rarely exists in the real world of theater exhibition.⁷⁹

In 2014, Paramount became the first major studio to stop releasing movies on film in the USA altogether. Paramount kept a low-profile about its decision because studios did not want to attract negative publicity for dropping film, which retains cachet among many filmmakers.⁸⁰

While celluloid purists have a point, digital technology also facilitates new ways of doing cinema. Digital film is thus more than a substitute for film. It opens for filmmakers new avenues and possibilities: 3D films, films with a high-frame rate, and much greater opportunities for editing and special effects. They can use new production techniques and new distribution platforms. This will actually disadvantage film theaters. The technical limitations of theatrical exhibition include less potential interactivity and social connectivity.

At the same time, digital technology makes it easier to alter the filmmaker’s product. Subsequent changes by the distributor, or network, or a government agency are possible, including many years later, with pressures for edits to conform to the cultural or political spirit of the day or to audience fashions.

76 StackExchange. “What Format Do Movie Theaters Now Use?” August 31, 2015. Last accessed June 27, 2017. ► <https://movies.stackexchange.com/questions/21754/what-format-do-movie-theaters-now-use>.

77 Statista. “Number of movie screens in the United States from 2008 to 2016, by format.” 2017. Last accessed June 27, 2017. ► <https://www.statista.com/statistics/255355/number-of-cinema-screens-in-the-us-by-format/>.

78 White, Ian. “Movies via Satellite: Theaters Look to the Skies for the next Generation of Content Delivery.” *Digital Trends*. March 8, 2013. Last accessed June 27, 2017. ► <https://www.digitaltrends.com/home-theater/movies-via-satellite/>.

79 It was therefore ironic that the film *The Wolf of Wall Street* became the first major studio film distributed all-digitially in the USA, given that its director was Martin Scorsese, who was an untiring advocate for celluloid film.

80 Verrier, Richard. “End of Film: Paramount First Studio to Stop Distributing Film Prints.” *Los Angeles Times*. January 17, 2014. Last accessed June 27, 2017. ► <http://articles.latimes.com/2014/jan/17/entertainment/la-et-ct-paramount-digital-20140117>.

Case Discussion

Film Distribution

Bertelsmann's films division UFA has several subsidiary film and TV production companies that produce movies that are distributed via cinemas, TV, DVD, online, pay-TV, and VOD. In 2008 it established UFA Cinema as its distribution arm. UFA Cinema aims to act as a producer-distributor for about eight films a year. In 2013, it had a retail market share of about 4% in Germany. It is also a distributor to

the German home entertainment market, for international TV productions by other producers. In contrast, the Hollywood distributors were much larger: UPI (Universal and Paramount) 21%, Warner Bros. 10%, Disney 11%, Sony 10%, Fox 9%. Two German distributors were Constantin (8%) and Tobis (4%).

For its own films, in addition to using its own distribution arm, UFA cooperates

with domestic and international movie distributors. It does not work exclusively with a single distributor but rather finds suitable distributors for each production. An example for the distribution inside Germany of an UFA film is *Jesus liebt mich* (2012), distributed by Warner Bros. Examples for a UFA film distributed by others outside Germany is *Hanni & Nanni* (2010) by UPI.

12.7.3 Book Distributors

12.7.3.1 Book Distributors: General

The number of new book titles is staggering: in the USA alone over 305,000 in 2013, though this number is slightly lower than for 2012. The major growth was in self-published books, where more than 700,000 books were issued in the USA in 2015,⁸¹ an increase of 375% in five years.⁸² Together, the number of new books published each year in the USA has grown by more than 600,000 since 2007, to well over 1 million annually. At the same time, more than 13 million previously published books are still available through many sources.

On the other hand, book sales peaked in 2007 and have either fallen or been flat in subsequent years, according to the Association of American Publishers.

There are about 3000 listed publishers in the USA. But what is a publisher? By another definition there are over 30,000 entities issuing books. Few books succeed in terms of circulation. Of the numerous titles, in a recent multiyear period, about

- 10 titles sold over 1 million copies;
- 67,000 books sold 1–5 thousand copies;
- 203,000 sold 100–1 thousand copies;
- 948,000 titles sold less than 100 copies.⁸³

All of these thousands of publishers, tens of thousands of bookstores and other outlets, millions of titles, and hundreds of millions of customers are linked by a very narrow distribution systems. In the USA the major book wholesalers/distributors are few in number, and dominated by Ingram and by Baker & Taylor. In the UK, they are Gardners and Bertram. A wholesaler serves publishers who want to outsource warehousing and logistics. Publishers use wholesale distributors for several reasons, in particular the cost and effort of

reaching thousands of retail stores. Several major publishers have distribution operations themselves, which may also serve other publishers. Such large operations include Bertelsmann's Random House Publisher Services in the USA and, with Pearson, TBS/GBS in the UK, and Hachette Publishing's distribution arm. Conversely, several major large publishers have reduced their wholesale distribution operations. HarperCollins (owned by News Corp.) shifted its front list distribution to R.R. Donnelley, the largest US printing company. There are also small specialized distributors. Continental Sales Inc. mostly distributes foreign publishers of English-language books. Greenleaf Book Group, IPG, Small Press, and Book Masters serve micropublishers.⁸⁴

Distribution is not just a delivery operation for packages. That is only the beginning. It means holding an inventory, which must be optimized. For example, publishers require a coordinated arrival of new books at multiple retailers to link in with promotional activities. And retailers, similarly, need to be assured of a rapid supply of a book when it gets promoted on TV shows and in advertisements. There are also large seasonal fluctuations in book sales and hence distribution. Late summer is the peak season for textbooks. It accounts for 60% of McGraw-Hill's revenues.⁸⁵ The Christmas season is big for books suitable for gifts. Summer is the time for the sale of light reading.

With IT systems, the management of book wholesale inventory management has become more integrated with retailing. Computerized inventory control means retail stores might find a copy in another store of its chain; or a publisher might go to one chain and ask them to return books which they can then ship to another.⁸⁶ Distributors can also become retailers. With POD, a distributor can offer books directly to readers. That is, of course, a delicate matter, since it means competing with one's own retailer customers.

81 Bowker. "Self-Publishing in the United States, 2010–2015." March 24, 2016. Last accessed April 5, 2017. ► <http://media.bowker.com/documents/bowker-selfpublishing-report2015.pdf>.

82 Piersanti, Steven. "The 10 Awful Truths about Book Publishing." *Berrett-Koehler Publishers*. September 26, 2016. Last accessed February 20, 2017. ► <https://www.bkconnection.com/the-10-awful-truths-about-book-publishing>.

83 Donadio, Rachel. "Backlist to the Future." *The New York Times*, July 30, 2006.

84 Rosen, Judith. "Distribution in a Digital Age." *Publishers Weekly*. April 13, 2012. Last Accessed October 18, 2012. ► <https://www.publishersweekly.com/pw/by-topic/industry-news/manufacturing/article/51512-distribution-in-a-digital-age.html>.

85 Maloney, David. "By the Book Distribution." *Modern Materials Handling* 58, no. 4 (April 2003): 33.

86 Fiscus, James. "Changes in book distribution drive up prices, reduce sales." *Science Fiction Chronicle* 23, no. 2 (February 2002): 32–35.

12.7.3.2 Case Discussion

Book Publishing Wholesale Distribution

Bertelsmann and Pearson established in 2013 the world's largest consumer-oriented ("trade book") publishing company, Penguin Random House. The joint venture is based in New York and is 53% owned by Bertelsmann, 47% by Pearson. In its main three markets (USA, UK, Germany) Bertelsmann relies on its own distribution operations through vertical integration. Bertelsmann's book distribution in Germany is often handled by its own distribution arm VVA. In the UK, Penguin Random House owns TBS and GBS, among the UK's largest book distributors. In the USA, bookstores and libraries can obtain Random House books through independent distributors such as Ingram and Baker & Taylor. Taking a further step, Bertelsmann also owns Random House Publisher Services (RHPS), which distributes Random House books and also those of several other publishers. RHPS operates huge warehouses in Maryland and Indiana. The Maryland operation picks, packs, and ships an average of a million books a day, including many international shipments.

Random House considers distribution one of its core competencies. It was named Amazon.com's Distributor of the Year in 2009. The company used to distribute only its own new and backlist

books (8000 new titles a year) issued by its nearly 100 imprints in North America. Most of those books were shipped as bulk ("full pallet") orders. It then instituted changes in its business and operational model of book distribution: in the past, its customers did not make small orders because they cost the distributor a lot more than larger orders and the price was therefore higher. RHPS had to bring down its cost of servicing small orders, and this required the building of an advanced picking and handling process.

By creating automated sorting technologies, RHPS was able to economically send much smaller quantities than before. Full pallets now comprise fewer than 10% of the units shipped. About 60% of the units are full cartons and 30% are individual titles picked to a mixed-book carton ("loose picks"). (There are 12 books in a carton, and 720 books in a pallet.) To do all this required major investment. In 2009 RHPS built an automated sorting technology using a single-tray tilt-tray sorter, with

- a 712-foot-long sorter;
- 250 double-level chutes for a total of 500 simultaneous potential sort/pack-out destinations;
- Overhead scanning of UPC bar codes.

Such a system can also provide third-party logistics and a direct-to-consumer service. RHPS thus added a successful third-party distribution business. It ships titles for several dozen smaller publishers to thousands of retailers, other distributors, wholesalers, and libraries, as well as direct-to-consumer online orders. For these publishers, RHPS provides warehousing, customer service, and back office support functions.

Bookstores had been increasingly returning books, and had to be refunded. These returns also had to be processed and returned to inventory, an expensive and slow transaction. RHPS strategy was to reduce these returns by speeding up its supply chain. Its aim was to encourage large customers to become driven by demand-pull. They should carry less inventory and order daily, based on the titles that were selling instead of ordering once a week or once a month in large quantities and then returning unsold titles. That way, fewer unsold books would be returned.

We conclude that Bertelsmann has been successful and innovative in the wholesale distribution of physical books. Online distribution activities for print and digital books will be discussed further below.

12.7.4 Newspaper Wholesale Distribution

Distribution accounts for 20% of a newspaper company's total cost. The architecture of newspaper distribution is hierarchical. For a physical product, it must be particularly rapid. A subscriber wants to get the morning paper at breakfast before leaving for work. The physical distribution architecture starts with the printing facility's loading dock. Transportation is carried out by trucks of the newspaper or third-party delivery service. They are then delivered to a newspaper's regional distribution centers, where the bundles are reloaded and trucked to retailers,⁸⁷ and to other delivery services that reach readers.

In the USA the market distribution for newspapers is largely local. Only a few newspapers are distributed nationally—*USA Today*, the *Wall Street Journal*, and the *New York Times*. Most daily newspapers use independent regional distributors which pay a wholesale price for a large quantity

of papers and resell them to retail outlets. Some papers pay contract distributors a set fee in exchange for delivery and retail, or hire salaried distributors. In Japan, more than 95% of distributed newspapers are home delivery subscriptions,⁸⁸ conducted by approximately 17,500 delivery and sales agents. (These *hanbaiten* are allowed to insert advertising sheets, so-called *chirashi*, into the papers they distribute, as an additional revenue source.) They employ more than 340,000 individuals (most of them part time), and typically service exclusively one newspaper. Given their size they are a powerful constituency, and newspapers cannot easily shift toward digital distribution without triggering a major backlash from the distributors.

12.7.5 Magazine Wholesale Distribution

Magazine publishers usually enter into multiyear contracts with third party distributors for national, regional, or market-by-market newsstand distribution services. After leaving the

87 Rehn, Jonas. "Information Flow and Physical Distribution Planning in Newspaper Delivery." *Royal Institute of Technology*. October 2001. Last accessed June 27, 2017. ► <https://www.nada.kth.se/utbildning/forsk.utb/avhandlingar/lic/011207abs.pdf>.

88 Pressnet. "Percentage of Home Delivery." Last accessed June 27, 2017. ► <http://www.pressnet.or.jp/english/data/circulation/circulation03.php>.

printing plant, the magazine products are moved to national and regional wholesalers, who then distribute to retailers of various sizes. But single copy sales have greatly declined in recent decades. Most magazines, especially those that are not consumer oriented, are sent instead by mail to subscribers, with the postal service as the distribution system for the publishers.

Curtis is the largest national magazine distributor in the USA, with \$1.5 billion in revenues and a 32% share of national distribution for single-copy magazine sales.⁸⁹ The second largest, Source Interlink, accounts for 30% of the single-copy distribution market. Source Interlink has also acquired magazines itself. Together, the top two distributors control almost two thirds of national distribution. There are

only two or three other national magazine distributors in the USA.

Regional wholesale magazine distributors operate in their geographical markets. But within those regional markets, concentration is high.⁹⁰ Another type of distributor is the magazine's printer. Some offer their customers logistics services. The big printing company R.R. Donnelley, for example, distributes magazines to news-stands with its own distribution fleet or in cooperation with logistics services such as UPS and FedEx.⁹¹

In the UK, similarly, a tiny number of firms dominated magazine distributors in 2015: Frontline (with 29% market share), Market Force (30%), COMAG (25%), and Seymour (14%).⁹²

12.7.5.1 Case Discussion

Magazine Distribution

Bertelsmann's subsidiary for magazine publishing is Gruner + Jahr. Its titles include approximately 285 magazines and newspapers in 22 countries. Publications include *Stern*, *Geo*, *Brigitte*, *Capital*, *YPS*, and *Auto Motor und Sport*. The main German competitors (Axel Springer, Hubert Burda, and Heinrich Bauer) have had double-digit increases in global revenue since 2008, owing to international expansion, while Bertelsmann's Gruner + Jahr has declined markedly,⁹³ losing its #1 position in the German market. Until 2005, Gruner + Jahr had a fairly good-sized presence in the USA. In that year, it sold its US women's magazines (*Family Circle*, *Parents*, and *Child and Fitness*) to Meredith, concluding that it could not establish a solid presence.⁹⁴

German magazine publishers are often the national distributors for their titles. There are also 76 independent magazine and newspaper wholesalers in Germany with 92 sales regions. Wholesalers have the

exclusive distribution rights for their region. They supply approximately 119,700 retailers with over 4000 titles.

Gruner + Jahr's own distribution subsidiary is Deutscher Pressevertrieb (DPV), established in 2006. DPV also distributes for other publishers: it distributed 7% of Germany's single-copy magazines in 2012. The main distribution competitors are operations by the other top magazine publishers Springer (13%), Hubert Burda (16%), and Bauer (19%).⁹⁵ DPV services include distribution control, direct/retail marketing for print and digital, logistics, import and export of media brands, as well as worldwide export of German and international newspapers and magazines.

The overall magazine market in Germany has been steadily decreasing, at about 1–2% per year.⁹⁶ Gruner + Jahr worldwide revenues decreased by 20% from \$3 billion in 2008 to \$2.5 billion in 2012. Subscriptions are the most

important distribution channel, but subscription price discount over retail sellers cannot, under German law, be higher than 15% of newsstand price.⁹⁷ This is a protectionist measure to help small retailers and newsstands.

Gruner + Jahr also directly distributes online magazines and newspapers either from their respective websites or from the company's online magazine website Pubbles.⁹⁸ Publishers sell the e-magazines by subscriptions or per-issue.

Thus Bertelsmann's magazine publishing has a decent access to distribution channels. In Germany, it is vertically integrated with its own distribution DPV. And globally, Bertelsmann runs an e-magazine platform. Access to distribution is not the cause for Bertelsmann's decline in magazine publishing on its home turf or in the USA.

89 Curtis. "Overview." Last accessed April 11, 2011. ► http://www.curtiscirc.com/1_about/index.html.

90 Harrisburg News Company. "Services: Book Distribution." Last accessed June 27, 2017. ► <http://harrisburgnewsco.com/distribution-services/book.asp>.

91 Quad Graphics. "Postal Consultation." Last accessed June 27, 2017. ► <https://www.qg.com/capabilities/logistics-services/postal-consultation>.

92 Based on company website.

93 Media Tribune. "Die Konkurrenz läuft Gruner + Jahr davon." September 5, 2012. Last accessed June 27, 2017. ► <http://www.mediatribune.de/nachrichten/die-konkurrenz-laeuft-gruner-jahr-davon>.

94 Seelye, Katherine Q. "Gruner + Jahr Said to Sell 2 Business Magazines." *New York Times*. June 21, 2005. Last accessed June 27, 2017. ► <http://www.nytimes.com/2005/06/21/business/worldbusiness/21iht-mag.html>.

95 Media Tribune. "Die Konkurrenz läuft Gruner + Jahr davon." September 5, 2012. Last accessed June 27, 2017. ► <http://www.mediatribune.de/nachrichten/die-konkurrenz-laeuft-gruner-jahr-davon>.

96 Seelye, Katherine Q. "Gruner + Jahr Said to Sell 2 Business Magazines." *New York Times*. June 21, 2005. Last accessed June 27, 2017. ► <http://www.nytimes.com/2005/06/21/business/worldbusiness/21iht-mag.html>.

97 DPV. "Distribution of Press in Germany." Last accessed September 4, 2012. ► [http://www.dpv.de/en/faqs-links/distribution-of-press-in-germany/subscriptions/](http://www.dpv.de/en/faqs-links/distribution-of-press-in-germany/subscriptions/http://www.dpv.de/en/faqs-links/distribution-of-press-in-germany/subscriptions/).

98 Haupt, Johannes. "Pubbles: Onlinekiosk von Bertelsmann ist da." *Lesen*. June 10, 2010. Last accessed June 27, 2017. ► <http://www.lesen.net/ebooks/pubbles-onlinekiosk-von-bertelsmann-ist-da-4132>.

Table 12.4 Global and regional market shares of the music group majors (2013)

| | Sony | Vivendi (UMG) | Warner Music | Others | Industry Concentration (HHI Index) |
|------------------------|------|---------------|--------------|--------|------------------------------------|
| North America | 23.6 | 34.9 | 17.6 | 23.9 | 2085 |
| Europe | 22.2 | 38.4 | 17.3 | 22.1 | 2267 |
| Asia (excluding Japan) | 18.5 | 22.8 | 13.4 | 45.3 | 1042 |
| Japan | 21.3 | 17.4 | 10 | 23.3 | 1162 |
| Latin America | 30 | 23.7 | 8.9 | 37.4 | 1541 |
| Australasia | 24.4 | 31.6 | 17.8 | 26.2 | 1911 |
| Africa | 24.2 | 36 | 7.9 | 31.9 | 1944 |
| World | 22.9 | 32.2 | 16.1 | 28.8 | 1820 |

12.7.6 Music Distributors

12.7.6.1 Music Distribution: General

There are two levels of intermediaries between the music artists and the user. The first is the label, which is the creation/production level. Labels are often part of a music group that functions as the distributor, the second level. The three major music groups (Universal, Sony, and Warner) are all distributors, but smaller independent distributors also exist, such as Alliance, Passport, Independent National Distribution, and The Orchard. The distributors (the wholesale stage) market and ship worldwide to retailers. They also promote the music by sending it to DJs, clubs, television and radio stations, and special events.

At the lower end of music distribution—as in several other industries—there is a type of wholesalers known as “rack jobbers,” a hybrid between operator and retailer. These companies set up and maintain racks in department stores. They purchase goods, such as CDs and DVDs, directly from the music producers at a discount and then sell them to—and sometimes in—the department stores.⁹⁹ In the latter case, the rack jobber does not sell the products to the store owner but displays and sells its products through the department store, in a kind of contingency arrangement. Unsold products are returned to the rack jobber without any loss for the store owner. In return for shelf space, the rack jobber either pays a leasing/rental fee to the store owner and/or gives up a percentage of the sales to the store owner. The

pricing depends on whether the rack jobber hires its own staff/salespeople.¹⁰⁰

Most music distribution, however, goes through the major three music groups. Labels and distributors used to be separate entities. But in the 1980s, the largely independent system of distribution became a problem for the major labels because their nationwide promotions required full co-ordination of record release, tours, and radio airplay. They therefore integrated vertically into national and international distribution. Today, the major music groups own many specialized labels around the world. Labels come and go,¹⁰¹ and market shares fluctuate with the popularity of star performers. The global and regional market shares of other music companies is small. The major distributors are the core of the global music business (Table 12.4).

The three major music group firms are vertically integrated into “music publishing” (copyright ownership and licensing), as well as production and distribution. They are (or were in the past) also integrated into other media activities such as film and TV, consumer electronics, and print, to enable cross promotion. Sony and Universal (UMG, owned by Vivendi) are integrated into various other media operations. This was also true in the past for CBS, RCA, Warner, and Bertelsmann.

99 Hull, Geoffrey P. *The Recording Industry*, 2nd ed. (New York: Routledge, 2004), 186–188.

1. Based on market shares before sale of BMG (Germany) music labels to Sony in 2008, and sale of EMI on market shares before sale of BMG (Germany) music labels to Warner (1/3) in 2013. Warner Music Group is independent of Time Warner.
2. Japanese HHI is calculated using Avex (14.7%), King (7.4%) and J-Storm (14.7%), King (7.4%)

100 CareerinMusic. “Become a Rack Jobber.” Last Accessed February 21, 2017. ▶ <https://www.careerinmusic.com/rack-jobber/>; Business Dictionary. “Rack Jobbers.” Last Accessed February 21, 2017. ▶ <http://www.businessdictionary.com/definition/rack-jobbers.html>; Dannenfeldt, Diane. “How Music Distributors Work.” *How Stuff Works*. July 17, 2008. February 21, 2017. ▶ <http://entertainment.howstuffworks.com/music-distributor1.htm>.

101 Vivendi’s Universal Music Group: Labels include MCA, A&M, Mercury, Island, Polygram, Polydor, London, Wing, Deutsche Grammophon, Verve, Geffen, Motown, Def Jam, Decca, and BMG Music Publishing. Sony Music Group was created out of CBS Records, RCA and the Bertelsmann Music Group (BMG). Its labels include CBS Records’ Columbia and Epic, and RCA records’ Ricordia, Ariola. Warner Music Group has the music labels WEA, Warner, Atlantic, Reprise, Elektra, Asylum, Atco, and Maverick. In 2003, Warner Music was sold to investor consortium including Edgar Bronfmann, and taken public in 2005. It is now owned by Access Industries. (Len Blavatnik). The percentage of “other” companies is remarkably small for most of the world’s regions, typically around 25%. The exceptions are Japan and the rest of Asia. However, the music style or artists are much less global than the above share of business would suggest. Music distribution is much less diversified internationally than music content.

12.7.6.2 Case Discussion

Music Distribution

Bertelsmann Music Group (BMG) used to be one of the world's five major music companies. BMG's global market share was 21.5%. Labels included RCA, Arista, J Records, Jive, and Zomba. Artists included Christina Aguilera, Britney Spears, Justin Timberlake, and Elvis Costello. In 2005, BMG merged with Sony's music group to

form Sony BMG Music Entertainment, the world's largest music firm. But in 2012 Bertelsmann sold its 50% share of the joint venture to Sony.

Bertelsmann also sold its music publishing (rights licensing) business to Universal. Subsequently, however, Bertelsmann built up a new music rights

management operation, with the private equity firm KKR. It held the rights to over 1 million songs, and it markets them to record labels, film studios, and TV networks. Bertelsmann was thus on track to become one of the biggest music rights companies in the world.

12.7.7 Consumer Electronics Distribution

Consumer electronic distribution costs (not revenue shares) vary depending on a variety of factors. For example, the 30 GB iPod had an estimated distribution cost of 10% of its retail price.¹⁰² A notebook computer is estimated to have only a 5% distribution cost because it is a much more expensive machine than an iPod.¹⁰³

Manufacturers take their products to ports for shipment to export markets. This initial part of the supply chain is its most inefficient part.¹⁰⁴ Once imported to their destination country, typically by container ships, consumer electronics shipments are put in large warehouses. These are run by a variety of operators: the manufacturing company itself, specialized wholesalers, general logistics providers, or the large retail chains. Compact high value consumer electronics are often air freighted from Asia to the USA and Europe, especially for new releases. The electronics industry accounts for around 40% of the value of the entire international air cargo industry.

12.7.8 The Compensation of Wholesale Distributors

12.7.8.1 Film

When consumers pay for watching a film, the retailer—movie theater, video rental store, VOD platform, and so on—keeps a share, and passes another share, or a fixed payment, to the distributor. The distributor, in turn, passes part of that money

to the producer and to the investors in the film, and to other claimants for payment.

The retailer's share in this pot will be discussed later in greater detail.

Box-office grosses are split between exhibitors and distributors by various arrangements. Retailers pay distributors for "rentals" in several ways:

- Flat rental: a fixed percentage of box office revenues for the "rental" of film (typically 50:50).
- Sliding scale: after a house "nut," the split in first week is often 80:10 in favor of distribution, and then declines to 70:30, 50:50, and so on.
- Minimum gross percentage. ("floors" for the distributor's share).
- "Four wall": distributor pays for the use of the theater. The rest goes to the distributor.

For video store distribution, originally the distributor got about \$60 as a flat fee from the movie rental store, allowing unlimited rentals for the life of the video.¹⁰⁵ The giant Blockbuster chain (subsequently bankrupt) replaced that with revenue-sharing, where the film's distributor got 40% of the rental fees from Blockbuster.

Of the "rentals" to the distributors, the distributor keeps a large share, and the rest goes to the producer, to investors, and to those stars and directors who have a profit or revenue participation. As mentioned, the distributor gets to keep the distribution fee that is charged against the film. It is a service fee for providing managerial overhead. It also includes the distributor's profit. The major distributors charge about 15% of total budget cost in the USA, or about 30% of adjusted gross receipts, such as box office. Rates are slightly higher for Europe and other countries. Smaller distributors are likely to charge less, about 20% for independent distributors without national branch-office networks and for specialized films shown only in selected locations.¹⁰⁶

102 Dedrick, Jason, Kenneth Kraemer and Greg Linden. "Who Profits From Innovation in Global Value Chains?: A Study of the iPod and Notebook PCs." *UC Irvine*. June 22, 2009. Last accessed June 27, 2017. ► http://web.mit.edu/is08/pdf/Dedrick_Kraemer_Linden.pdf.

103 In China, 30% of the cost of a product in 2005 was attributable to the domestic supply chain, compared with 10% in America and Europe. Dedrick, Jason, Kenneth Kraemer and Greg Linden. "Who Profits From Innovation in Global Value Chains?: A Study of the iPod and Notebook PCs." *UC Irvine*. June 22, 2009. Last accessed June 27, 2017. ► http://web.mit.edu/is08/pdf/Dedrick_Kraemer_Linden.pdf.

104 Weaser, Mark. "New Logistics Systems Will Increase Efficiency, Boost Profits in China." *Supply Chain Brain*. September 1, 2005. Last accessed June 17, 2017. ► <http://www.supplychain-brain.com/content/logisticstransportation/transportation-distribution/single-article-page/article/new-logistics-systems-will-increase-efficiency-boost-profits-in-china/>.

105 Epstein, Edward. "Hollywood's New Zombie: The last days of Blockbuster." *Slate*. January 9, 2006. Last accessed June 17, 2017. ► http://www.slate.com/articles/arts/the_hollywood_economist/2006/01/hollywoods_new_zombie.html.

106 Caves, Richard E. *Creative Industries: Contracts Between Art and Commerce*. Cambridge: Harvard University Press, 2000.

The distributor also gets to “recover” from the film—that is to keep—direct expenses for advertising, print of copies, other marketing expenses,¹⁰⁷ and interest for the money spend along the way. These are called the distribution costs. They tend to have a healthy profit margin built in. Furthermore, advertising billings are subject to a 10% overhead. Interest on financing loaned by the distributor to the producer for production costs also get recovered first.

12.7.8.2 Book Distributor Compensation

In theory, the discount wholesale price given by publishers to wholesaler and bookstores is often 50% of suggested retail price. In practice, most books are discounted by publishers; and the distribution chain gets 52–58% of suggested retail price. But with bookstore chains offering their own discounts off the suggested retail price, this tends to bring it back to a 50:50 split at a lower price.¹⁰⁸ Wholesale discounts by publishers of the suggested resale price can vary considerably, and relate to size of the orders, total invoice value, and number of copies. A large book retail chain will seek at least 45–56% on paperback trade titles. Smaller publishers may offer only 33–35%, given their expenses and the small print run. For school titles the discounts are 20–25%, and for school books they are usually around 17½%.¹⁰⁹ A large book chain will seek at least 45–56% on paperback trade titles. Publishers penalize booksellers who order single copies of titles, supplying them at a discount of only 20–25%.

12.7.9 Wholesale Distribution: Trends

12.7.9.1 Trend 1: Retail and Wholesale Functions Are Merging as Large Retail Chains Emerge

The large retail chains deal directly with manufacturers/producers, and this reduces the role of wholesalers. What seems to be emerging is a replacement of the three-stage system with a two-stage one. The vertical convergence of retailer/wholesaler, together with the horizontal concentration in the retail level, leads to very powerful distribution intermediaries between producer and consumer.

12.7.9.2 Trend 2: Increasing Market Concentration in Wholesale Distribution

Wholesale distribution was always concentrated for film, music, books, and magazines. Online media distribution adds still further to this market concentration, with

- enormous economies of scale;
- the ease to port distribution platforms and models across countries and across products (e.g. Amazon).

12.7.9.3 Trend 3: Do Distributors Take Over Production?

Distributors of content have often extended into and dominated production, in film, music, or TV. The next chapter of such expansion might be written right now. Netflix, Google (YouTube), Amazon, Verizon, AT&T, and Apple have entered the content production business. Already, Amazon and Apple have achieved a scale and importance in distribution that puts them into a position to dictate a pricing structure to book and music publishers.

A concluding observation: the share that wholesalers keep of what consumers pay for the product. It is, on average, 18.3%, after subtracting their own payments to producers and creators (see the appendix to this chapter). It is much higher for film (40.8%) and lower for books (6.3%); magazines (3.8%); newspapers (2.2%), and online media (5.5%). It is higher, by 57%, for physical content media than for electronic content media (23.1% versus 14.7%). It is larger where

- a major marketing activity is required (such as film);
- the distributor has a financial stake or an active role in the shaping of the media product (film, music) or must buy it from producer (film);
- a large inventory must be kept (consumer electronics);
- the product’s potential for success is low (music).

12.8 Retail Distribution: Physical Distribution

12.8.1 Film

Retailing is the resale of a product or service to the enduser, typically consumers. It can be done by small and specialized companies catering to a narrow or local customer base, or by large and global companies with outlets in many cities and a wide assortment of products. It also includes e-tailers who operate online.

12.8.1.1 Film Retail Distribution of Film—Channel #1: Theaters

The rise of film theaters was a phenomenal cultural change. By 1929, 35 years after the first film was made, and just three years after the first talking movie was released, over two-thirds of the US population was going to movie theaters at least once a week, and often more than six times.

At each film theater company, “circuit” buyers analyze the prospects of a film, based on previews and factors such as ratings. In Hollywood’s heyday, the studios could require blind bidding (booking films sight unseen) and block booking (buyers must book films in groups, giving poor films a market). These practices are often legally prohibited.

Hollywood used to dominate theater ownership. In 1945, five major studios owned 17% of all US theaters and 45% of all theater revenues. In 92 big cities, more than 70% of the first-run theaters were affiliated with a studio. In 1948, government forced the divestiture of movie theaters from studios. In 1990s, studios were allowed to purchase theaters once again, but their attempts to do so were unsuccessful.

¹⁰⁷ Epstein, Edward Jay. *The Big Picture, The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005.

¹⁰⁸ Alexander, Alison, James Owers, and Rodney A. Carveth. *Media Economics: Theory and Practice*. Mahwah, NJ: Lawrence Erlbaum Associates, Publishers, 2004.

¹⁰⁹ Zell, Hans. *Book Marketing and Promotion: A handbook of Good Practice*. (Oxford: INASP, 2001), 51–55.

Table 12.5 Film theater companies (North America, by screens)

| | |
|---------------------|------|
| AMC | 7852 |
| Regal | 7295 |
| Cinemark | 4499 |
| Cineplex | 2892 |
| Marcus | 681 |
| Harkins | 446 |
| Southern Theatres | 445 |
| B & B Theatres | 409 |
| National Amusements | 409 |

In 2017, there were 40,246 movie screens in the USA.¹¹⁰ The number of tickets sold in 2000 was about 1.39 billion, declining to 1.27 billion in 2014 and 1.2 billion in 2015.¹¹¹ **Table 12.5** shows the major film theater companies in 2015.¹¹²

No circuit of theaters, even AMC and Regal Cinemas with their 7000-plus screens at hundreds of locations, do not fully cover the USA, and the distributors therefore must cobble together their theaters for a nationwide release.

There was a big investment push into film theaters. In 1980s, multiplex and then megaplex theaters opened in the USA. Such theaters then emerged also in Europe and Japan. Economies of scale, improved sound, stadium-style seating, parking and shopping opportunities are the reasons for the rise of such theaters. In 2016, there was approximately one screen per 8000 people, or 12 screens per 100,000.¹¹³ (In some countries, such as France, the number was twice as high, but almost everywhere else it was much lower.) For example, there were two competing megaplex theaters with a total of 52 screens in Ontario, California, right next to each other. In each geographical zone, which each contain 100–400,000 people, a theater gets an exclusive license to show a film.¹¹⁴ But the rise of “clearance zones” had fallen from 15 miles in the 1960s to 2–3 miles in 2002. Why this theater glut? Shopping-mall operators encouraged theaters as “anchor” tenants to generate evening traffic. Wall Street financiers liked the theater business because of its huge free cash flow.

Many multiplexes have 10–20 screens with theaters of relatively small seating capacity. This development was accelerated by the Americans with the Disabilities Act of 1990, which requires that theaters with more than 300 seats pro-

vide full wheelchair access. As a result, theater owners, when renovating, reduce the size of auditoriums to less than this number. Not uncommonly, one projectionist services up to eight screens, which lowers costs.¹¹⁵ In consequence, movie screens in the USA more than doubled over two decades—from 16,000 in 1980 to over 35,000 in 2000 and 40,000 in 2014. But only 50% more tickets were sold in 2000 than in 1980, and thereafter the numbers were declining. There were not enough attractive movies to fill theaters, and fewer films are being made by Hollywood. Films could be early watched on cable TV and satellite, and later online as VOD.

As a result, capacity utilization of film theaters dropped, while they carried high debt and costly leases with mall owners. Under severe economic pressure, several major chains consolidated or declared bankruptcy to reorganize their debt and renegotiate onerous leases. By the late 1990s, four of the top six theater chains had filed for bankruptcy. The average price of a screen film theater, as measured per screen, collapsed sharply from \$700,000 in 1998 to \$135,000 in 2001. As a result of consolidation, the market share in terms of box-office revenue of the top three chains rose from 29% in 1997 to 40% in 2001,¹¹⁶ and 47.7% in 2015. In terms of total screens, the market share of the top three chains soared from 24% in 1997 to 31% in 2001 and 48.9% in 2015. The major theater chains screen the films, and rental deals get negotiated. Such large chains such as AMC or Regal use their own buyers to book films while small chains and independent theaters use third-party buyers.

Theaters typically share revenues with the films’ distributors. The fees paid by theaters to the distributors are called rentals. Box office ticket revenue is split between the distributor and exhibitor on a formula basis.¹¹⁷ The percentage of ticket sales given to studios as a rental fee typically declines after the first week.

For films by the Hollywood majors, the theaters get to keep about 54% of ticket prices, while for independently distributed films they keep around 60%. Arthouse theaters keep 60–65% of ticket prices for rentals, given the high cost of marketing relative to the audience size. Usually, the theater takes the entire box office revenues up to an agreed upon amount (the “house nut”), and the distributors gets a percentage of all revenues beyond it. That rate may rise in the theaters’ favor the longer the film has been out. Thus a playdate that grosses \$5000 in box office in a week with a \$1000 house nut and a 70/30 split means \$2800 (70% of \$4000) for the distributor and \$2200 (\$1000+ 30% of \$4000) for the exhibitor. If the split changes to 40/60 in the next week, then the exhibitor will receive \$3400 and the distributor \$1600 for the \$5000 gross. Because the time a film will be shown in a theater depends on demand and is not determined in advance, some contracts guarantee a floor for distributors, similar to the theater’s house nut.

110 Statista. “Number of cinema screens in the United States from 2008 to 2014, by format.” 2015. Last accessed June 11, 2015. <http://www.statista.com/statistics/253355/number-of-cinema-screens-in-the-us-by-format/>.

111 The numbers. “Domestic Movie Theatrical Market Summary 1995 to 2015.” Last accessed June 15, 2016. <http://www.the-numbers.com/market/>.

112 National Association of Theater Owners. “Top 10 U.S. & Canadian Circuits.” Last accessed June 27, 2017. <http://www.natoonline.org/data/top-10-circuits/>.

113 How many screens can a city support? In 2000, San Francisco was the leader in the US among large cities, with over 20 screens per 100,000 population, four times the New York figure.

114 Epstein, Edward. *The Big Picture: The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005.

115 Epstein, Edward Jay. *The Big Picture, The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005.

116 Alderston, Derek, Jeffrey Karish and Roy Price. “Revenge of the Multiplex.” *The McKinsey Quarterly*. (Autumn 2002): 6. (Adjusted for 2015 data).

117 Alpert, Frank and Jon Silver. “Digital dawn: A revolution in movie distribution?” *Business Horizons* 46, no. 5 (2003): 57–66.

Because this can get complicated and contentious, a simpler model aggregates all revenues and then splits them according to a fixed percent. In the USA, that portion for theaters was 40–50% of revenues but has gone up. (Often, however, theater owners withhold payments claiming a grievance, and then demand to renegotiate the deal.) In contrast, in Australia, the top two theater chains get 70–75% of revenues, based on their dominant market power. In the UK, it is about 60%.¹¹⁸ In Japan, two theater chains, Tojo and Shokeda, control about 90% of the theaters suitable for international films and require a very high share of the box office revenues. As a result, the Hollywood distributor UIP began to build its own theaters in Japan.¹¹⁹

To police this revenue sharing system, film distributors use box office reporting firms such as Rentrak or online services such as Boxofficemojo.com to collect box office revenue figures. Most theaters have computerized box office figures, and those of non-reporting theaters are then extrapolated. To avoid undercounting by theaters, film distributors also send auditors to do spot checks of ticket sales at theaters.

The key goal for theater operators is to reduce the overcapacity of seats (the occupancy rate is often lower than ten over the year) by selecting attractive films, all while serving peak loads. Their own management tools are few in number—their prices are set when it comes to individual films, and the marketing and promotion is conducted by the distribution company.

In selecting films for exhibition, the theater chain must make some choices. Are the films likely to be popular? Do the actors starring in them have a following? What are the competing films offered at the same time? Who are the target demographics for the film and its promotion? How do these demographics relate to those of the theater's market area? Is the film likely to open strong and then fizzle, or have “legs”? Does the film itself have a brand image, such as a sequel? What is the season in which the film will be released? What is the nature of the long-term relationship with the distributor which the theater wishes to maintain?

Many films open to poor sales and never recover. But it is during that first week or two that the share of the theater is low. They will make money when the film has legs. Films targeting adolescents such as horror and comedy tend to do well right away, on a single weekend, and then drop. A rule of thumb is that a week-to-week box office drop of 40% or more means that audience interest is nearly gone. In contrast, films that target a more mature and educated audience tend to build over a longer time. Family films also build more slowly because parents who take their kids to a film need time to get organized.

12.8.1.2 Film Retail Distribution Channel #2: Home Video

While the home video business has been squeezed by online distribution, it is still sizeable. It benefited from the consumer's desire to liberate herself from a set schedule of movie

theaters. Large video chains supplanted the numerous mom-and-pop rental stores. But they overexpanded and got clobbered when DVD technology enabled more convenient mail order rentals from Netflix. At the other end of the spectrum, large general retailers became heavily involved in the cheap sale of popular videos. They often use DVD sales as loss leaders to build traffic for their store.¹²⁰

A different approach to home video rental is the use of vending machines. In the USA, Redbox rents out movies for \$2. It has only 70–200 titles at any time, but it substitutes a low price and convenience for lack of choice. Redbox is available at more than 34,000 locations in the USA. Its rental peaked at 776 million in 2013, and then declined.¹²¹ But it accounts for 52% of the physical video rental market, and 12.5% of overall users in 2017. Redbox faced obstacles from the major studios about the timings for their new films. The studios tried to delay the time when Redbox can rent out new films from 28 days after the theatrical release to 56 days.¹²²

12.8.1.3 Film Retail Distribution Channel #3: TV and Cable

The principal licensees of Hollywood movies, whether in the USA or in other countries, are pay-television channels. The main US firms are HBO (Time Warner), Showtime (Viacom), and Starz (Liberty Media). Companies in other countries include News Corp. (Sky), Vivendi (Canal Plus), Sony, and Naspers (South Africa). As an example, for the film *Gone in 60 Seconds*, HBO (Warner) paid its media rival Disney \$18.7 million to show the film for two years.

The distribution window for the national broadcast TV networks opens about two years after the theatrical release. Owing to the high cost of the Hollywood films in the early years of a release sequence, the networks favor their own made-for-TV movies. In 2003, the four major networks together bought only 20 new studio films. They each paid about \$20–\$45 million per movie, for three showings over a three-year period. This added to licensing payments of \$750 million, about \$200 million from each network. Globally, the six major Hollywood distributors earned \$1.8 billion from sales to broadcast stations and networks. There was also a licensing of older films from the studio libraries, which generated \$426 million of revenue.¹²³

The distribution of video by online video-on-demand platforms is discussed further below.

118 Alderston, Derek, Jeffrey Karish and Roy Price. “Revenge of the Multiplex.” *The McKinsey Quarterly*, (Autumn 2002): 6. (Adjusted for 2015 data).

119 Epstein, Edward Jay. *The Big Picture, The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005.

120 Epstein, Edward Jay. *The Big Picture, The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005; Waterman, David. “The Economics of Media Programming.” In *Handbook of Media Management and Economics*. Eds. Alan B. Albarran, Sylvia M. Chan-Olmsted, and Michael O. Wirth. New York: Lawrence Erlbaum Associates, 2006.

121 Statista. “Number of items rented out at Redbox kiosks from 2010 to 2014 (in millions).” 2015. Last accessed June 15, 2016. ► <http://www.statista.com/statistics/296377/redbox-number-kiosk-rentals/>.

122 Gruenwedel, Erik. “The Vanishing Video Store Rental.” *Home Media Magazine*. April 3, 2012. Last accessed June 28, 2017. ► <http://www.homemediamagazine.com/research/vanishing-video-store-rental-26860>.

123 Epstein, Edward Jay. *The Big Picture, The New Logic of Money and Power in Hollywood*. New York: E.J.E. Publications, Ltd., Inc., 2005.

Case Discussion

TV and Cable Retail Distribution

Bertelsmann's RTL is Germany's largest private TV broadcaster in terms of audience. It started broadcasting in Germany in 1984 from its original home base in Luxembourg (the L in RTL). When private broadcasting was introduced in Germany in the 1980s, RTL was among the first to be licensed and obtain frequencies. It soon started broadcasting from Cologne, Germany. The content gradually moved from low-priced US TV series and quiz shows to its own low-budget reality TV and major sports coverage, TV series, and film rights to major studios' libraries.

Bertelsmann's TV networks in Germany, its home base, are

- RTL Television;
- VOX;
- RTL II;
- n-tv;
- Super RTL.

In 2016 RTL's overall audience share in Germany was 12.6% (9.7% RTL, 1.8% for Super RTL, and 1.1% for n-TV).¹²⁴ In 2013, RTL announced its move out of terrestrial broadcast. Already, its over-the-air coverage in Germany was spotty. RTL's move was seen by some as the beginning of the end

of terrestrial broadcast in Germany. The reason for the discontinuation was that for the company broadcasting a channel was much more expensive than cable/satellite distribution, while 96% of its viewers received its programs via cable/satellite. (Fewer than 10% of households in Germany use terrestrial broadcast technology as their primary way to receive TV programs.) The actual technical distribution system of terrestrial broadcast TV in Germany is operated by several companies.¹²⁵

Bertelsmann's RTL Group also broadcasts in France. It owns the major French broadcast stations M6 and W9, and a joint-venture pay-TV (TF6) that is distributed terrestrially. RTL9 is a terrestrial broadcast service transmitted from Luxembourg, which can be received also in the north-east of France.¹²⁶

RTL is also a major broadcaster in Belgium, Luxembourg, and the Netherlands. Luxembourg has no public TV stations and has always been more liberal in giving out broadcast licenses. Its station Radio Luxembourg, with its strong signal, was a major pop music station in the 1960s and 1970s for British teens seeking an alternative to the stodginess of the BBC, which

until the 1980s held the radio monopoly for the UK. RTL also broadcasts terrestrially in Spain, Hungary, and Croatia. Bertelsmann's RTL video channels are also distributed to viewers over satellite and cable TV in many European countries.

RTL's channels are free and advertising supported. But the users' subscription to the cable and satellite platforms is not free. In many countries, TV viewing also requires the payment by viewers of a special viewing license fee set by governments. In Germany, for example, viewers pay a monthly government mandated TV fee (GEZ) of about \$20 per household.¹²⁷ Part of that then gets passed on to public TV broadcasters and to cable providers, but not to RTL.

RTL pays cable operators a fee for the distribution of channels. This fee is negotiated. The two-sided financing model of cable operators stems from the 1980s when the state-owned Deutsche Bundespost held a cable monopoly. This is in contrast to the situation in the USA, where the channel providers receive payment from the infrastructure network providers. In Germany, in contrast, the content provider (RTL) pays the cable operator.¹²⁸

12.8.2 Book Retailing

12.8.2.1 Book Retail Distribution Channel #1: Stores

In recent years the main innovations in the book industry were those of retail distribution. Innovations were retail chains and megastores, online retailers and online delivery (Table 12.6). Traditionally, book retailing was based on thousands of small retailers (bookstores), a few large wholesalers (in the USA, four majors), several direct-to-consumer operators (book clubs and mail order publishers), and some direct distribution or large or regular endusers, such as school systems and university libraries.

Large bookstore chains began to emerge in the 1960s. Barnes & Noble has over 1000 stores in the USA, including 400 superstores. What are the advantages of book chains and

Table 12.6 US booksellers (2014)

| | Type | Market share ^a (%) |
|---------------------|----------------|-------------------------------|
| Amazon | Internet | 29 |
| Barnes & Noble | Book chain | 20 |
| Apple | Retail chain | 10 |
| Wal-Mart/Sam's Club | Retail chain | 5.5 |
| Costco | Warehouse club | 4.5 |
| Books a Million | Book chain | 2 |

^aForbes. "What's Driving Sam's Club's Growth?" February 5, 2014. Last accessed June 28, 2017. ► <http://forbes.com/sites/great-speculations/2014/02/05/whats-driving-sams-clubs-growth>

124 Statista. "Market Share of television channels in Germany in 2016." 2017. Last accessed June 28, 2017. ► <https://www-statista-com.ezproxy.cul.columbia.edu/statistics/380528/tv-channels-audience-market-share-germany/>.

125 The key company is Media Broadcast GmbH (► <http://www.media-broadcast.com/fernsehen/sendernetze/dvb-t.html>), the distribution services for TV stations. It formerly belonged to the German telecom incumbent operator Deutsche Telekom and was then sold to the French TV organization TDF Group. TDF Group itself is owned by private equity firms AXA Capital, Charterhouse (UK), TPG (USA), and FSI (Sovereign Fund of the French government). Media Broadcast GmbH, in turn, does not own the radio towers used for transmission but rents capacity or antenna space on towers belonging to either the Deutsche Funkturm GmbH or to the public TV stations. Deutsche Funkturm GmbH, in turn, belongs to the telecom giant Deutsche Telekom and owns and operates 500 towers in Germany. Media Broadcast GmbH offers distribution from the studio to the end customer. A mixture of landlines, satellite uplinks, and directional microwave antennas is

used to get the signal to the TV towers. The company, with about half a billion Euros in revenues, has often been criticized for being a quasi-monopoly. However, there are no regulated prices and Media Broadcast can set them under the constraints of following certain rules of transparency.

126 Other smaller RTL channels (M6 Music, Paris Première, Fun TV) are not distributed terrestrially. Similar to Germany, terrestrial TV in France is distributed over third-party provider facilities, mainly the TDF Group that also owns the main German distribution service.

127 Digital Femshen. "Kabel-Streit: Bundeskartellamt gegen Vorgehen von ARD und ZDF." June 12, 2012. Last accessed June 28, 2017. ► <http://www.digitalfernsehen.de/Kabel-Streit-Bundeskartellamt-gegen-Vorgehen-von-ARD-und-ZDF.87853.0.html>.

128 Rapid TV News. "Kabel Deutschland pays RTL for HD channels." June 28, 2012. Last accessed June 28, 2017. ► <http://www.rapidtvnews.com/2012062822753/kabel-deutschland-pays-rtl-for-hd-channels.html#axzz4ZWz6sOqM>.

megastores? They have a central buying system, record of sales history of books, large selection, bigger advertising budgets, sales history, and inventory control. They also offer amenities such as coffee bars for longer store visits, and visits by authors.

Critics of superstores believe that all they carry are popular titles. However, there are 50,000–200,000 titles in superstores compared with 20,000 in a small store. Another fear is that superstores deter book buyers, when in fact they made shopping and browsing more attractive due to lower prices, a greater selection, more convenience, and stronger promotion. Other critics believe that these stores have shifted the public reading taste downmarket to bestsellers and potboilers. Some of this may have happened. But one should not overromanticize the quality choices of past generations of book buyers. Subsequently, online publishing and distribution have shifted choice in the opposite direction, to more specialization and more titles, including more high-quality book content.

Sales of art, literature, and poetry books actually grew 10% from 1993 to 1996 when megastores emerged, compared with a growth of 4% for popular fiction. The extra 70,000 titles stocked by a superstore are usually those in light demand, so the typical copy in retail inventory is less likely to find a buyer within a given period of time. It is then more likely to be returned for credit, so the chains' return rate rates are therefore higher than those of independent bookstores.¹²⁹ To counteract this, the chains instituted systems in which books from one store can be rapidly moved to another when needed. This reduced their overall inventory needs.

The competition problem in book retailing is that the chains obtain substantial discounts from publishers, which negatively affects the survival of small bookstores. While higher retail prices are not consumer-friendly, they keep more bookstores in business and encourage the smaller store to hold a larger inventory relative to sales.

One peculiarity of book distribution is the ability of the retailer to return unsold books to the publisher for nearly full credit. A third of bestsellers are unsold and are returned; in some cases more.¹³⁰ For example, of Bill Clinton's *Between Hope and History*, 70% of books shipped to bookstores were returned unsold. Returns reduce risk and increase profit for retailers. But they also increase net demand on publishers through the physical display of product. Large retail chains have a better inventory management system which results in a lower return rate. This and other contractual arrangements concerning returns result in lower wholesale prices to these chains, which translates into a competitive advantage.

Retail Price Maintenance for Books

The competition between large bookstore chains and small booksellers has been reflected in legal and political battles. In many countries, book publishers must fix the retail price

and force the retailers to adhere to it. This system is called resale price maintenance (RPM). Book stores then compete not on price but on the quality of their service and the titles available (see also ► Chap. 11 Pricing of Media and Information).

In the USA, RPM, below-cost pricing, dumping, and price fixing are mostly prohibited.¹³¹ In 2007, in the case of *Leegin Leather Goods*, the US Supreme Court eliminated the outright ban on RPM for maximum prices and ruled that vertical price restraints are not per se illegal but shall be viewed within their circumstances a "rule of reason."

Price discrimination, too, is outlawed in the USA. The small retailers have thus sued publishers over their discounts to chains, arguing that they were not cost based and were hence price-discrimination. In other countries, booksellers have tenaciously defended retail price maintenance, under which a publisher sets a uniform price and prevents price discounts. Online distribution has disrupted government influence over the publishing and distribution sector in several countries. In France, price competition among booksellers was outlawed in the so-called Lang Law, and bookstores had to charge the same price to buyers (a 5% deviation was permitted). With the advent of ebooks, this system was challenged. Legislation was then passed: ebooks were included in an expansion of the Lang law, and a regulatory body was given the power to control the pricing of ebooks relative to print books. Such prices would be set by consultation between the Ministry of French Culture, the French Literary Society (authors), and the National Union of French Publishers.¹³²

In Australia, RPM is illegal regardless of its effect on the competition.¹³³ In Japan, the Sanhai System (Japanese RPM), established in 1953, allows owners of copyrighted material to set the minimum retail price of newly released or rereleased products (including CDs, records, cassettes, books, magazines, and newspapers).¹³⁴ In Germany, the RPM system has existed in Germany since 1888. For a while it was optional, but a 2002 law requires every publisher to fix its book prices. Retailers are not allowed to sell at lower prices or to give any rebates—whether direct or indirect—to the buyer. If a retailer sells for less, it is excluded from future supply of the book. Perhaps owing to this protection, the German retail store market is unconcentrated.¹³⁵ In 2006, the retail store market leader Thalia accounted only for 7% of total book sales. In comparison, in the USA the market leader, Barnes & Noble, had that year a market share of about 27%.

131 Montgomery, Stephen L. *Profitable Pricing Strategies*. New York: McGraw-Hill, 1988.

132 Bridenne, Meriam. "The Google Hachette Pact." *Melville House Publishing*. December 6, 2010. Last accessed December 7, 2010. ► <http://mhpbooks.com/moby/lives/?p=20734>.

133 OECD. "Resale Price Maintenance." 1997. Last accessed June 29, 2017. ► <http://www.oecd.org/competition/abuse/1920261.pdf>.

134 Nippop. "Saihan Seido – Japan's Resale Price Maintenance System." Last accessed on May 23, 2011, at ► http://nipppop.com/features/Saihan_Seido___Japan_s_Resale_Price_Maintenance_System/.

135 CESifo. "CESifo DICE Report 3/2003." 2003. Last accessed June 28, 2017. ► <https://www.cesifo-group.de/ifoHome/publications/journals/CESifo-DICE-Report/Archiv/CESifo-DICE-Report-2003.html>.

129 Caves, Richard E. *Creative Industries: Contracts Between Art and Commerce*. Cambridge: Harvard University Press, 2000.

130 Hendrickson, C.T., H.S. Matthews, and D.L. Soh. "Environmental and Economic Effects of E-Commerce: A case Study of Book Publishing and Retail Logistics." *Transportation Research* 1763, no. 1 (2001): 6–12.

12.8.2.2 Book Retail Distribution: Channel #2: Book Clubs

Book and record clubs can sell to consumers cheaper than other retailers because there is very little inventory holding cost of the books, or returns of books. Distributors know exactly how many books are going to be distributed to members. The retailers are also being leapfrogged. Often publishing and clubs are vertically integrated. This has been the case for Bertelsmann, which expanded through its clubs. Conversely, the book club Bookspan began to publish its own books. Book clubs were allowed to send members books before they were released to bookstores. More recently, some book clubs have adopted a subscription rental. Bookspan is allowing members to borrow multiple books at \$9.95 per month with free shipping, and then return them.

Generally, book clubs have been declining,¹³⁶ but there have been notable exceptions. Oprah's Book Club was run by the TV personality Oprah Winfrey. However, it was not a distribution system as the other clubs are, but rather a presentation and discussion of books recommended by her. It was responsible for 28 consecutive best sellers. About 15 million viewers watched Oprah's Book Club on TV each month. The books she introduced focused on issues similar to her TV shows, such as schizophrenia, cheating husbands, or foster children. An Oprah-type novel is a moving, painful story and is not too hard to read. It is usually written by a woman (22 out of 28) and the brand name was Oprah, not the author's. Previously selected authors showed a dramatic drop in publication of their subsequent books without the celebrity endorsement of the book-show host. Still, being selected was beneficial for authors and publishers.

12.8.2.3 Book Retailing Distribution: Channel #3: E-Tailing of Physical Books

In 1994, a young hedge fund manager, Jeff Bezos, surveyed top mail order products and found that books represented a perfect category for ecommerce in terms of prices and convenience. Mail order catalogs, let alone retail stores, could not comprehensively cover books because of the huge numbers of titles. He started the company Amazon.com, and relocated to Seattle to take advantage of proximity to Ingram, the largest book wholesaler in the USA. Amazon was innovative in using the capabilities of online. It provided search engines, personalized suggestions, feedback from the reader community, and more. Initially, Amazon had no physical facilities for books and acted solely as an intermediary for orders. In time, it created distribution centers, strategically located in states with low or no sales tax.

Not surprisingly, several traditional booksellers expanded to online bookselling. In the UK, the top two chains Waterstones and W.H. Smith both have them. Traditional booksellers in Japan with online stores are Kinokuniya,

Junkudo, and Maruzen (which is teamed with amazon.co.jp). In the USA, Barnesandnoble.com customers can pick up books at Barnes & Noble stores. Amazon bought Bookpages (a large online bookseller), which became amazon.co.uk, and Telebook (Germany's largest online bookseller), which became amazon.de. Amazon also acquired joyo.com and became one of the two major online bookstores in China.¹³⁷ Alapage is an online bookseller in France.

12.8.2.4 Book Retail Distribution: Channel #4: Print-on-Demand

It is difficult to predict consumer demand for a book. This can lead to books sitting around in warehouses (known as "rotten fruit") or, conversely, being sought after yet out of print. These problems can be fixed with POD technology. Consumers are able to print out books at special locations, such as a bookstore, and it only takes a few minutes to print, glue, and bind a book.¹³⁸ The technology allows for books to be produced and sold in small quantities, even one at a time. It reduces inventories (by publishers, wholesalers, and retailers) and creates a "pull model" for book production.

BookSurge software automates the printing process so that even single-copy print orders can be easily done. Amazon bought Book Surge in 2005.

POD entrants are copying chains such as Kinko's (acquired by FedEx) and bookstores. Ingram, the largest US book wholesaler, acquired Lightning Source, a POD service, in a move which will edge close to a retailing role by Ingram once its terminals are set up in locations outside bookstores.

POD has resulted in specialized models of publishing itself, because it lowers the entry cost for a new publisher and the risk associated with an upfront printing of books whose sales potential is uncertain. BlazeVox has played an important role in avant-garde poetry and innovative fiction. At its most extreme, POD makes self-publishing by a single author, either directly or through an intermediary, quite convenient. POD business volume has been increasing rapidly.

POD titles are deployed, for instance, in selected Barnes & Nobles or Books-A-Million stores. But consumers rarely print previously published books on demand. Instead, they mainly use these printers to print self-created content for their private use.¹³⁹ The number of self-published titles has increased significantly. As mentioned, the number of self-published print books (i.e. not ebooks) in the USA rose to more than 700,000 in 2014, with an annual growth rate of approximately 50% since 2008. The clear market leader in this field is Amazon's CreateSpace, with a market share of more than 60%. Amazon prints all of its titles on demand.¹⁴⁰

¹³⁷ Hu, Dawai. "The Chinese publishing industry." Ehrengast 2009, Frankfurt, 2009. Last accessed July 7, 2010. ▶ <http://www.docstoc.com/docs/20816258/The-Chinese-publishing-industry>.

¹³⁸ Macprint. "Offering You The Latest Printing Press Technology." 2009. Last accessed July 25, 2011. ▶ <http://fahadlatesttechnology.blogspot.fr/2009/11/offering-you-latest-printing-press.html>.

¹³⁹ Hoffelder, Nate. "Books-a-Million is Pleased with its Espresso Book Machine Pilot." *Digital Reader*. March 1, 2014. Last accessed June 29, 2017. ▶ <http://the-digital-reader.com/2014/03/01/books-million-pleased-espresso-book-machine-pilot/>.

¹⁴⁰ Bowker. "Self-Publishing in the United States, 2008–2013." 2014. Last accessed June 29, 2017. ▶ http://media.bowker.com/documents/bowker_selfpublishing_report2013.pdf.

¹³⁶ Examples of the book clubs in the USA are Book-of-the-Month Club, Literary Guild, Black Expressions, Audio Book Club, Double Day, Stephen King Library, Disney's Winnie the Pooh Book Club, and the Mystery Guild.

12.8.2.5 Case Discussion

Book Retailing

Bertelsmann's book distribution has several very different channels:

- bookstores;
- book clubs;
- POD;
- ebookstores;
- ebook distribution.

Bertelsmann owns no retail bookstores, but supplies independent booksellers and large chains through its own wholesale operations, RHPS, VVA, TBS, and GBS, or through other wholesalers.

Random House used to sell many of its books through Bertelsmann's book clubs, based on a membership model with required purchases. This distribution channel was a major factor in the company's growth into a media giant. The same system was also used for music. Authors and publishers vied for Bertelsmann's book club distribution. The success of the book clubs made Bertelsmann a major publisher by giving its own books a wide distribution. Soon, it bought up several smaller publishers. In time, however, consumers drifted away from clubs. In 2011, Bertelsmann closed its book club division, which at the time still had 15 million subscribers in 16 countries. It sold its US book club to the Bookspan operation.

Until 2009, Random House owned 49% of Xlibris, a provider of self-publishing and on-demand printing services, but then sold it.

Bertelsmann started Bertelsmann Online (bol) in 1999 as an ebookstore, competing with Amazon.com and Barnes & Noble's BN.com. But after major losses and a restructuring efforts, it sold off bol.de.

Bertelsmann engages in ebook distribution on its own distribution platforms, as well as on other platforms. It started four ventures related to ebooks. In Germany, these were

- Skoobe, an ebook library for rental;
- Tolino, as an ebook e-retailer.

In 2012, Bertelsmann launched the first of these: the mobile direct-to-consumer Skoobe ebook distribution platform for smartphones and tablets, focused on German-language ebooks. (Skoobe is "ebooks" spelled backwards.) Its model was not selling but renting-out books, just as Netflix does for films online. It charges users €10 a month subscription to borrow up to two titles for 30 days. Renting books is cheaper than buying them. Skoobe's main selling points are price and a wide range of recently published ebooks and a user-friendly design.

The second ebook distribution venture was Tolino. This ebook platform was launched in 2013 by Bertelsmann and Germany's three major physical book retail chains, Thalia, Weltbild, and Hugendubel, together with phone giant Deutsche Telekom. Thus Tolino brought together Germany's top physical booksellers, its largest media company, and its largest telecom company, all joining to compete with Amazon and Apple. Previously, each of the five had its own ebook business, with a combined market share of 35%. There was no governmental or EU anti-trust intervention into this venture that joined major horizontal competitors and vertical buyers/sellers.

Tolino launched with over 300,000 titles, as well as a proprietary device. The Tolino Shine e-reader was a 6-inch backlit e-ink device that went on sale in 2013 for €100. It was available at 1500 retail book stores as well as 11,000 Telekom stores throughout Germany.

Another online distribution, mentioned earlier, is Pubbles, a subsidiary of Bertelsmann's Gruner + Jahr magazine division. Pubbles is an ebook and emagazine store. Gruner + Jahr distributes its various magazines and newspapers either directly from their respective websites or from Pubbles. Sales are either by subscriptions or per issue. The site has received poor reviews.

In the USA, Random House Publisher Services (RHPS) handles ebook related distribution services for Random House and for third-party publishing companies. Random House ebooks are also distributed on other platforms.¹⁴¹ They are available through Amazon, Google eBookstore, iBookstore (Apple), nook (Barnes & Noble), ReaderStore (Sony), Kobo (Rakuten, Japan), and others.

To sum up: Bertelsmann's bargaining strength as a publisher, in dealing with large e-tailers like Amazon or Apple, has weakened over what it used to be relative to traditional retailers. Its strength in direct-to-readers book club distribution has collapsed, together with that form of distribution more generally. Bertelsmann's efforts to offset these trends by entering online distribution of physical books or of ebooks, or operating POD, have either failed or must yet show success.

12.8.3 Magazine and Newspaper Retailing

The retailing of magazines and newspapers, typically in newsstands or multiproduct retailers such as convenience stores, drug stores, and supermarkets,¹⁴² is known as single copy sales. That form of distribution has been declining steeply,¹⁴³ at about 10% per year. Factors were: the much cheaper sub-

scription prices relative to single-copy sales;¹⁴⁴ changing consumer shopping patterns (fewer impulse purchases, fewer shopping trips); a shift to digital reading and a proliferation of digital devices—smartphones offer far more news choices than a retailer, and with more convenience; a decline in the number of locations selling single copies, which reduced distribution cost but limited availability;¹⁴⁵ and the prevailing system in which newsstands and other offline retailers could return unsold copies, which shifted the risk of weak sales to the publisher. The result of these factors was a decline in

141 Random House also operates an online shop that lists the ebook options for a title, when an ebook version is available. But the shop only refers buyers to the respective third-party shops of Amazon, Apple, and so on. Thus RH avoids competing directly with its own major ebook readers.

142 Supermarkets are the largest retail center for single-copy magazine sales in the USA, with 35.6% market share.

143 Doctor, Ken. "Newsonomics: Single-copy newspaper sales are collapsing, and it's largely a self-inflicted wound." *Nieman Lab*. March 13, 2005. Last accessed February 24, 2017. [▶ http://www.niemanlab.org/2015/03/newsonomics-the-collapse-of-single-copy-sales/](http://www.niemanlab.org/2015/03/newsonomics-the-collapse-of-single-copy-sales/).

144 Magazine titles that discounted their subscription prices by more than 70% declined by 16% at the news-stand, four times more than magazines that discounted subscriptions by less than 10%.

145 Dool, Greg. "Newsstand Sales Fell 16 Percent in 2015." *Foliomag*. March 14, 2016. Last accessed June 29, 2017. [▶ http://www.foliomag.com/newsstand-sales-dropped-16-percent-in-2015/](http://www.foliomag.com/newsstand-sales-dropped-16-percent-in-2015/).

physical retailing to secondary status. For magazines, retail news-stand and supermarket sales make up only a small share of their overall sales. Even for consumer magazines, less than 15% of total circulation is through retail outlets.¹⁴⁶ For example, *Rolling Stone* magazine gets only 5% of its circulation via news-stands,¹⁴⁷ *Vogue* 20%, and *Time* magazine 1.8%. Celebrity publications are the most popular magazine category at newsstands, but this is also the category that has lost the most sales. Also relatively well-performing retail sales are magazines presenting highly visual information that is best done in print, examples being food, home decorating, and travel destinations.¹⁴⁸

12.8.4 Music Retailing

Arguably, no part of the media industry has been more affected by electronics and online technologies than the traditional retail distribution of content. And no media retail distribution has been more affected than that of music.

Before the 1970s, there were two kinds of record retailers. They were stand-alone specialist shops and general

department stores that included hit record racks. They had different supply channels. The specialist ordered records from independent “one-stop wholesalers.” Department store racks were served by independent rack jobbers who selected titles and stocked the racks. Music was also retailed by record clubs.

In the 1990s, online stores such as CD-Now and Amazon emerged as retailers of physical music products. A few years later, direct downloads began, at first illegally and without payment. Subsequently, -pay online stores also entered, particularly the Apple iTunes Store. This put specialized retailers under enormous pressure. Since 1999, annual retail music sales have dropped by about 10% each year to \$8.0 billion,¹⁴⁹ and even more so for independent retailers.

There are various ways to sell digital music. Apple sells music via its iTunes store on a model in which users acquire a song or album and downloaded it to their devices. Since 2015 Apple has also let users access music via a streaming service (Apple Music), whereby the music would only be played when connected via the internet. Since 2015, overall streaming revenue (Apple, Pandora, Spotify, and others) surpassed digital download revenue in the USA.¹⁵⁰

12.8.5 Case Discussion

Retail Distribution

Bertelsmann retail distribution of music proceeded on four tracks:

- music clubs;
- retail stores;
- online sale of physical recordings;
- online music.

BMG had two strong distribution arms: direct-to-consumer music clubs, and its in-house wholesale to retailers for distribution. Bertelsmann also sold music through the Bertelsmann Media Club and its other clubs. These distributed music records directly to millions of subscribers. The model was one of “negative option billing,” with customers receiving monthly shipments and bills unless they expressly unsubscribed for the month. These channels were leveraged into a content role by Bertelsmann in music. So popular were its clubs as distributors of music, including that of non-BMG labels, that the clubs did not actually secure formal licenses to distribute the records they

sent to members. Instead, they paid most music labels based on the standard royalties set by copyright law, but discounted by 25%. Its customer base was so large and important to music labels that they acquiesced. Bertelsmann’s clubs mostly ceased selling music in 2009, due to declining music sales, online piracy, and the lower popularity of clubs as a form of distribution.

The original online free sharing operation Napster posed a serious challenge to the recording industry. Napster users did not pay BMG any license fees. The music companies successfully used the courts to shut down Napster and others such as Grokster, but many other file-sharing services soon emerged.

The music companies, in grudging response, created legitimate online distribution systems: Duet (PressPlay) (Universal/Sony/Yahoo) and MusicNet (BMG, Warner, EMI, AOL, and RealNetworks.) MusicNet was clunky and unsuccessful; its focus was to

undercut piracy, not to provide a positive user experience.

BMG’s third strategy was much more imaginative: to partner with Napster. In 2000, Bertelsmann loaned Napster \$50 million to develop a secure file-sharing system that would “preserve the Napster experience” while compensating copyright holders. Bertelsmann paid over \$85 million to keep Napster alive. In 2002, Bertelsmann tried to buy the assets of the bankrupt company. Bertelsmann would have used the Napster brand and technology to sell music from its own BMG, and possibly from other labels, via the Napster platform. At the time, this was pretty revolutionary for the stodgy music group business.

Bertelsmann’s interest in Napster was driven by its intention to convert Napster into a legal sales channel for its music and to be able to use synergies for its music division BMG. Bertelsmann was attracted by Napster’s brand identity among young

146 Vasquez, Diego. “Behind magazines’ decline on the newsstand.” *Medialife*. February 13, 2014. Last accessed June 29, 2017. ► <http://www.medialifemagazine.com/behind-magazines-decline-newsstand/>.

147 Rolling Stone. “Circulation.” 2016. Last accessed February 24, 2017. ► <http://www.srds.com/mediakit/rollingstone/circulation.html>.

148 Vasquez, Diego. “Behind magazines’ decline on the newsstand.” *Medialife*. February 13, 2014. Last accessed June 29, 2017. ► <http://www.medialifemagazine.com/behind-magazines-decline-newsstand/>.

149 Lee, Louis. “Taps for Music Retailers?” *Business Week*. June 23, 2003, 40.

150 Bloomberg. “Apple’s iTunes Overtaken by Streaming Music Services in Sales.” March 22, 2016. Last accessed June 17, 2016. ► <http://www.bloomberg.com/news/articles/2016-03-22/apple-s-itunes-overtaken-by-streaming-music-services-in-sales>.

audiences, and its software. In exchange, it got a 58% interest in Napster. However, the deal was challenged by the other music labels and blocked by the US bankruptcy court.

Because BMG sold out to Sony, Bertelsmann does not distribute music anymore. But by looking at Sony's online music distribution for BMG's past labels, one can roughly extrapolate how BMG would have been acting more recently. How does Sony distribute BMG's previously owned labels' music? It has several operations:

- Sony Entertainment Network (SEN);
- Vevo;
- Apple iTunes;
- Google Play;
- Amazon;
- Musicbox.de.

SEN provides access to several services, including Sony's PlayStation Network, Video Unlimited, and Music Unlimited. The latter is Sony's on-demand streaming music service, Subscription costs \$10 per month. This service, after not succeeding in the marketplace, was absorbed into a new service called PlayStation Network, including PlayStation Video and PlayStation Music. PlayStation Music is a partnership with Spotify, established after Sony closed down its old Music Unlimited service. Spotify users are able to use the PlayStation Music app as part of their subscription.

Sony also offers its songs and albums on Apple's iTunes retail music service and on Google's retail Play Store for Android devices. Songs are priced at \$1.29, \$0.99, \$0.69, and free. Apple and Google keep 30% of the revenues. Sony also distributes

via Amazon MP3, with Amazon keeping 15%. Songs are priced from \$0.89 to over \$1, and they are digital rights management (DRM) free, meaning they can be listened to on virtually any music-capable device.

In Germany, Sony Music offers its songs on musicbox.de which exclusively sells songs from Sony Music artists. Musicbox.de users can buy and download songs as MP3 files or ringtones.

A music video website, Vevo, is operated as a joint venture. Universal Music Group (owned by Comcast) owns about 49% of Vevo, Google has 10%, and Sony Music Group and Abu Dhabi Media own the rest. Advertising revenues are shared with Google. Vevo has about 21.4 billion views a month, which translates to about 1010 million hours of video viewed each month. The majority of visitors come from mobile devices.

12.9 Online Retail Distribution

The internet is not a physical network per se, but a network of networks—a data system that rides on various telecom infrastructure networks, linking local area computer networks with each other. It also uses cable TV infrastructure and other specialized networks, including the internal computer networks of companies and universities. ISPs organize the end close to the users—for a fee—and can provide some of their own network equipment such as hubs and routers, and at times transmission lines. The capacity (bandwidth) of internet communications had greatly increased, from dial-up narrowband to always-on broadband, whose bandwidth keeps getting bigger.

The major ISPs in the USA in 2016 were Comcast (27.3%), Charter (25%), AT&T (17.2%), Verizon (7.8%), Century Link (6.6%), and Altice (4.3%). The remaining providers had a market share of 11.8%.¹⁵¹

Within the two main categories of ISPs—telecom firms AT&T and Verizon, and the cable companies Comcast and Charter—there is no real competition because their service territories are not overlapping. Competition is with the companies of the other type of platform. Dimensions of competition are price, download speed, connection type (fiber versus coax versus DSL or hybrid combinations), reliability, access to wi-fi hotspots, and amount of data that can be downloaded.

One of the major uses of the internet is for the distribution of media content and for its retailing to end users, including transactions of search, purchase, storage, and finance. Online distribution is mostly another form of retailing. But

it often straddles the retail and wholesale stages. It enables an intermediary—sometimes traditional, sometimes new—to link between producers and consumers. There are different models:

- A traditional retailer extends backwards directly to the producer. For example, the book retail chain Barnes & Noble Online leapfrogs much of the wholesale distributor.
- A traditional wholesale distributor may reach consumers directly. For example, HBO Go leapfrogs the cable TV and satellite retail intermediaries.
- New intermediaries emerge to reach end users. An example is Apple iStore.
- Producers link up directly with consumers. An example is *The Guardian* newspaper or the *New York Times*, leapfrogging wholesale and retail intermediaries.

12.9.1 Business Models for Online Media Retailing

The new online model of distribution leads to several business models. They are:

- advertising;
- pay-per-read/view/listen;
- subscription;
- public subsidies;
- the community model: storage and delivery of user-generated content.

12.9.1.1 Advertising-Based Content Provision

- Music: Pandora, Google YouTube, Vevo.
- Video: Dailymotion, Veoh, Facebook Live Crackle, Yahoo View, Vudu Movies on Us, CNN.
- Games: Rovio Entertainment, King Digital Entertainment, Mojang, Supercell, and Niantic.

151 Statista. "Number of broadband internet subscribers in the United States from 2011 to 2016, by cable provider." 2017. Last accessed June 29, 2017. ► <https://www-statista-com.ezproxy.cul.columbia.edu/statistics/217348/us-broadband-internet-suscribers-by-cable-provider/>.

- Text: most magazines make part of their content available online for nothing, with advertisements. Some so-called e-zines are purely online, such as Shortlist Magazine and Stylist Magazine. There are also many magazine-like websites with feature stories. Some reference book publishers such as *Encyclopaedia Britannica* provide ad-supported text content.
- News: *AP*, *Huffington Post*, *Slate*. Most newspapers offer their content. Major exceptions are the *Wall Street Journal*, the *New York Times*, and the *Financial Times*.

The advertising-based business model is by far the most prevalent for text based content, for social-media type video, and for a good number of commercial music and video services. This is a logical continuation of traditional print and broadcast media being supported by advertising dollars. However, the problem of advertising as an economic foundation is that there is a huge supply of advertising opportunities online relative to the attention to such ads and to their effectiveness, and hence the price of advertisements is much lower. The former CEO of the media giant NBC Universal, Jeff Zucker, memorably summarized the problems of moving to online distribution as “trading analog dollars for digital pennies.” Whereas the cost per 1000 impressions (CPM) in 2017 for TV networks averaged \$24.40 and for newspapers \$35, for online video it was merely \$3 and for online text display ads \$2.03.¹⁵² Of this, the ad placement service of Google keeps 32%, so that the web publisher gets \$1.38. On the positive side, ads can be targeted more precisely and with greater effectiveness. Yet this advantage would already be reflected in the willingness-to-pay by the advertiser, that is, in demand. Without it the prices would be still lower.

At the same time, the cost of creating online content is not lower but more expensive, if anything. It is true that digital technology makes production and distribution cheaper. But the greater competitiveness of content providers also means the need for more technical bells-and-whistles, for a higher frequency of updates such as news, and for greater marketing efforts. It also means more fragmented audiences, which translates to a smaller number of users having to support a higher cost operation through their value to advertisers. That audience is too small for most online content providers to provide an economic base, yet large enough in the aggregate to squeeze the larger media providers too.

12.9.1.2 Online Content for Sale or Rent

- Music: Apple iStore, Google Play, Amazon Music.
- Video: Amazon Instant Video, Apple iTunes, Vudu. CinemaNow also offers rental/purchase but most of its films are purchase only.
- Games: Steam, EA Origins.
- Text: ebooks from Amazon, Barnes & Noble Online.

- News (by the story): *Wall Street Journal*, *New York Times*, academic journals

For film or TV programs, the video-on-demand (VOD) (or the related but more limited pay-per-view, PPV) system has been offered since 1993 by cable TV, and then satellite telecom companies. It then migrated online where it is widely used. Some content is streamed for a once-only use while connected. In other cases, the period of use is timed and one can stream the item repeatedly during that period, thus enabling a resumption or repeat of viewing. Other content is downloaded for storage and use at any time by the user. In practice, the separation is not neat, with some downloaded material expiring after a few weeks, and conversely streamed materials that can be resumed or repeated for a while. A similar process has taken place with music, where much of it sold online through downloads or streams, in particular from Apple iTunes. Other providers are Amazon Music, Google Play Music, and emusic.com. Online text publishers, too, have taken steps in the direction of the sale of discrete items of content, though with no particular success. Under the pay per read (or pay per article) system, a newspaper charges a small amount for an article. It is a micropayment system for microtransactions. A provider exploring the pay per article model is Blendle, the Dutch news platform startup with some funding from the New York Times Company and the German publisher Axel Springer AG. Newspaper articles cost between 19–39 cents, while magazine stories cost 9–49 cents. Publishers get to keep 70%. There are no ads.¹⁵³ It recommends stories by algorithm as well as human choices. Readers who feel the article was not worth it can opt for an immediate refund. About 20% of those who register end up linking their credit card to the service.

Micropayments allow for complex pricing strategies. Price differentiation, group pricing, loyalty discounts, disaggregation, and tie in with products flourish in micropayment systems. The pricing can get very complicated. But those prices cannot be easily sustained when competition comes into play. Only unique content will sustain high or discriminatory prices.

12.9.1.3 Subscription-Based Content

- Music: Spotify, Google Play Unlimited, Pandora.
- Video: Netflix, Amazon Prime, HBO Now, Hulu Plus.
- Games: Interactive World of Warcraft (Activision Blizzard), NC Soft (Lineage, South Korea).
- Text: ebooks: Kindle Unlimited, Scribd.
- News: *Wall Street Journal*, *Financial Times*, *New York Times*, many magazines, Next Issue.

The *Wall Street Journal* began in 1997 to erect a pay-wall for subscriptions. At first, registered users dropped by 90% but the count eventually recovered. At the other extreme of size,

¹⁵² Online ads charge on a “per click” basis (CPC). For text display ads CPC averaged \$0.58. The click rate per impression was) 0.35%. CPM this translates to a price of \$2.03.

¹⁵³ Ha, Anthony. “Pay-per-story news service Blendle comes to the US.” *Tech Crunch*. March 23, 2016. Last accessed June 29, 2017. ► <https://techcrunch.com/2016/03/23/blendle-us-launch/>.

a small local paper, the *Champagne News Gazette*, also sold news subscriptions. It charged \$4.50 a month just for sports because of a popular columnist and because of the nostalgia of University of Illinois alumni who wanted to stay in touch. The *New York Times* began to charge for access to its columnists in 2005. Online subscribers could also access archives and real estate posts. This did not work well. No one wanted to pay for columnists' opinions when so much opinion was available for free everywhere online. Eventually all content became subscription based, though offered with deeply discounted content. The emergence of mobile tablet and smartphone devices gave *New York Times* subscriptions a major boost.¹⁵⁴ There were 2.6 million digital-only subscribers at the end of 2017.

Thus it seems that users are willing to pay for a subscription when that online news source is the only provider of local news, or when the news source is an authority on its subject matter, such as the *Wall Street Journal*, *Handelsblatt*, *Financial Times*, or *Le Monde*. Readers will not pay for commodity news.

An example of magazine subscription services that go beyond the individual magazine with flat-rate offerings for text are UK-based Readbug, which is nicknamed “Spotify for magazines.” Readbug offers an all-you-can-eat content model across its selected magazine titles for £10 per month.¹⁵⁵

Many content providers have moved into a mixed model of “freemium” pricing in which they offer a basic product for nothing and charge a premium for a better grade of the service. In music, Spotify offers premium service for downloads and ad-free streaming for \$10 per month, with 25% of its active users being paying subscribers. Spotify's ratio of paid to free users has held steady as the company has moved beyond early adopters.¹⁵⁶ Pandora implemented a subscription model with a freemium strategy: users can choose between free ad-supported radio listening or an ad-free premium which costs \$5 a month.¹⁵⁷ Pandora's pay-users account for only 4.9% of listenership, but they contribute over 20% of Pandora's revenue.¹⁵⁸ For newspapers, the *New York Times* gives all visitors ten free articles per month; to read more they need to pay for a subscription. This is known as a metered payroll.¹⁵⁹

Online content sites can also potentially raise revenues through transactions such as travel and e-commerce based on advertisements they display. However, they do not have obvious advantages over other more sophisticated websites.

12.9.1.4 Public Subsidy-Based Model

- Music: public broadcasters and music performance organizations such as publicly supported symphony orchestras.
- Video: public broadcasters (BBC, ARD, PBS, etc.). In addition, many films and TV production are subsidized by public funds directly or through tax shelter arrangements.
- Games: various countries, such as France, offer some form of public subsidy to game developers and distributors. Some games are created as governmental projects. One example was *America's Army*, which was made for the US Army.
- Text: universities, government agencies and their publications.
- News: public broadcasters, international mouthpieces of governments (RT, VOA, Al Jazeera, CCTV). A large number of traditional public broadcast organizations have branched out into online provision of their past, or current content. It is a natural extension of their reach and mission, including globally. These activities are often supported by the existing payment mechanism of public TV, based on user fees or government grants. This has been opposed by commercial media companies.

12.9.1.5 The Community Model: Retailing of User-Generated Content

- Music: SoundCloud, Google YouTube, Mixcloud, Bandcamp.
- Video: Google YouTube, Vimeo, Dailymotion, Facebook Live, Dailymotion, Veoh.
- Videogames: Steam, EA Origins (developers create games and upload them, and have to pay \$100; then games are available through the service Steam Direct).
- Text: Wikibooks, Fanfiction, Reddit (Condé Nast), Digg.

This form of retail distribution has arguably been the most innovative contribution of the internet for content creation and consumption. There are various models of content sharing—both via unlicensed piracy and legitimate creation by members of the community who share it with others. Some of it, when successful, becomes advertising-supported.

Having analyzed the various types of business models to support online media distribution, we now take a look at several of the major online media industries themselves.

12.9.2 Online Distribution of Film and Video

Video servers store online content and serve them on demand. Capabilities include access control, encryption, and compression as well as billing, users' social interaction,

154 Doctor, Ken. “Newsonomics: The New York Times is setting its sights on 10 million digital subscribers.” *Nieman Lab*. December 5, 2016. Last accessed June 29, 2017. ► <http://www.niemanlab.org/2016/12/newsonomics-the-new-york-times-is-setting-its-sights-on-10-million-digital-subscribers/>.

155 Lomas, Natasha. “Readbug Wants To Be Spotify For Indie Magazines.” *Tech Crunch*. November 21, 2015. Last accessed June 29, 2017. ► <https://techcrunch.com/2015/11/21/readbug-wants-to-be-spotify-for-indie-magazines/>.

156 Dormehl, Luke. “A Whopping 25% of Spotify's 60 Million Active Users are Paying Customers.” *Fast Company*. January 12, 2015. Last accessed June 29, 2017. ► <https://www.fastcompany.com/3040781/a-whopping-25-of-spotifys-60-million-active-users-are-paying-customers>.

157 Yiranni. “What makes Freemium work? Lessons from Pandora.” June 1, 2016. Last accessed June 29, 2017. ► <https://yirannny.wordpress.com/2016/06/01/what-makes-freemium-work-lessons-from-pandora/>.

158 Israelite, David. “Freemium Model Works For Pandora But Is Devastating To Songwriters.” *Hype Bot*. September 25, 2015. Last accessed June 29, 2017. ► <http://www.hypebot.com/hypebot/2015/09/freemium-model-may-work-for-pandora-but-is-devastating-to-songwriters-op-ed.html>.

159 Norris, Ashley. “Is the New York Times Paywall a Success? What can it teach other publishers?” *Fipp*. October 7, 2015. Last accessed June 29, 2017. ► <http://www.fipp.com/news/opinion/is-the-new-york-times-paywall-a-success-what-can-it-teach-publishers>.

polling, and user measurement. They can also insert advertising, including targeted ads.¹⁶⁰

A media player is software on the user's computer device to translate the digital data stream into visual media images and sounds that can be recognized by human analog senses. Major examples are Windows Media Player (Microsoft), Quicktime (Apple), and Real Player (Real Networks). Media players may also include DRM in order to limit unlicensed use.

The architecture of online distribution of video can be:

- Centralized architecture: The originating server is responsible for serving all users (“clients”).¹⁶¹
- Proxy-based architecture: Remote proxy servers copy and store (“cache”) the materials of the central server. They are located close to the user and thus reduce the load on the central server, as well as reducing transmission needs (and cost) and lowering delay (latency).
- Program caching: only popular content is stored on proxy servers. The reason is that the most popular 30% of the files receive 80% of requests.
- Request routing: a number of servers exist; client requests are routed to the best server, in terms of content availability, congestion, and distance.

The distribution of content from the video platform's servers to the internet is provided by a so-called content delivery network (CDN). This is a network of high-performance transmission links capable of carrying numerous video streams simultaneously. CDNs also provide content platforms with a widely dispersed network of servers that store content files to be accessed by users in a decentralized way. The CDN places files in different places so that the user can receive the nearest copy of it faster and the service provider uses transmission capacity efficiently.¹⁶² This is particularly important for content sites streaming large video files, and those with heavy traffic in different countries. Content platforms enter into contracts with CDNs that frequently include guarantees of service quality. Content providers and distributors have also been building their own CDNs, in particular Google, Netflix, and Amazon. CDN companies include Amazon (about 25% of US market), Akamai (25%), Edgecast (8.5%), Max CDN (7%), and Cloudflare (7%). Other companies (with a combined market share of 27%) include Level 3, Microsoft Azure, Limelight, Rackspace, CDNetworks, and Cachefly.¹⁶³

Online video has rapidly taken off. It has become the main use of the internet, in terms of quantity of transmission. Already in 2014, video traffic accounted for 78% of overall internet packet traffic online in the USA. So rapidly was its usage growing that Netflix accounted for 33% of prime-time internet traf-

fic in 2012 and 57.5% in 2014, eclipsing Amazon, Hulu, and HBO Go.¹⁶⁴ That rapid increase slowed down as rivals caught up. In 2016, Netflix accounted for 35.2% of prime-time internet traffic and Amazon 4.3%.¹⁶⁵

A large number of content providers, packagers, and platform providers have emerged. They include, in the USA, the following:

- Fox, Comcast (NBC), Disney & Time Warner, offering jointly the online video service Hulu;
- Viacom: CBS All Access; Showtime Anytime;
- Time Warner: HBO Go and HBO Now;
- Google: YouTube;
- Netflix;
- Amazon Prime Video;
- AT&T: DirecTV Now;
- Dish: Sling TV;
- Apple: iTunes;
- Sony: Playstation Vue;
- Facebook: Facebook Live;
- Microsoft: Microsoft Store. In addition Microsoft provides Xbox game consoles which show over-the-air broadcast TV for free;
- Snapchat;
- Twitter Periscope (UGC);
- Walmart: vudu;
- Vimeo;
- BBC;
- Vivendi: Dailymotion;
- CinemaNow;
- Disney: ESPN, Hulu;
- Sports Leagues: NBA, NFL, MLB, WWE;
- Verizon: AOL, Yahoo, FiOS;
- Veoh (P2P);
- Vevo (music videos);
- most TV networks and cable channels have individual online sites with offerings of video content.

Clearly, this sector will consolidate considerably and most likely focus around several central nodes, which are likely to be the “cloud providers” who will be the primary integrators of content, platforms, advertising placement, data, and interactive technology. Their advantages include:

- providing the convenience of a few access points to consumers;
- bridging the diversity of technical standards used by content providers;
- compliance with global laws and regulations;
- financial distributions to the various participants in the value chain;

160 Picard, Robert and Jeffery Brody. *Newspaper Publishing Industry*. Needham Heights, MA: Allyn & Bacon, 1997.

161 Thounin, Frederic and Mark Coates. “Video-on-Demand Networks: Design Approaches and Future Challenges.” *IEEE Network*, March 19, 2007.

162 Sexton, Patrick. “Content Delivery Networks.” *Varvy*. October 10, 2015. Last accessed June 29, 2017. ► <https://varvy.com/pagespeed/content-delivery-networks.html>.

163 Hearty, Jon. “CDN Market Share Update December 2013.” *Datanyze*. December 10, 2013. Last accessed June 29, 2017. ► <https://resources.datanyze.com/blog/cdn-market-share-update-december-2013>.

164 Edwards, Cliff. “Netflix Dominates Streaming Rivals in Web-Video Market.” *Bloomberg*. November 7, 2012. Last accessed July 9, 2013. ► <http://www.bloomberg.com/news/2012-11-07/netflix-dominates-streaming-rivals-with-growing-web-video-share.html>; Phillips, Matt. “Morgan Stanley on Netflix: ‘Sustainable Competitive Advantage.’” *Wall Street Journal*. December 6, 2010. Last accessed July 9, 2013. ► <http://blogs.wsj.com/market-beat/2010/12/06/morgan-stanley-on-netflix-sustainable-competitive-advantage/>.

165 Spangler, Todd. “Netflix Chews Up Less Bandwidth, as Amazon Video Streaming Surges.” *Variety*. June 22, 2016. Last accessed June 29, 2017. ► <http://variety.com/2016/digital/news/netflix-bandwidth-share-2016-1201801064/>.

- marketing, branding, and quality control;
- management of privacy and security;
- ability for personalization due to extensive access to user data;
- technological sophistication;
- deep pockets.

The main players in this cloud-based future global video system could well be, given today's evidence, internet-based platform companies such as Google, Amazon, Facebook, Apple, Microsoft, and Alibaba. This is further discussed in ► Chaps. 3 and 8.

Netflix was started in 1997 by Reed Hastings and Marc Randolph as a service to rent and sell DVDs over the internet. It offered a popular DVD-by-mail service. The total number of Netflix's DVD-by-mail subscribers peaked at 24.6 million in 2011 and then declined in favor of the online streaming service. In 2012, Netflix had a total of 27 million US streaming subscribers; in 2015, 62.3 million (41.4 million in the USA), and in 2017, 98 million (50.8 million in the USA). Netflix spent about \$3.2 billion for its content acquisition and creation in 2014^{166, 167} and \$6 billion in 2017.

The content cloud providers are differentiating themselves by creating vertical extensions into content creation. In 2013, Netflix started to offer its own content: the 13-episode drama *House of Cards* with Kevin Spacey, which got much attention. Amazon, too, has been producing its own original content, including such award winning shows as *Mozart in the Jungle* and *Transparent*. It also produced the Oscar award-winning movie *Manchester by the Sea*.¹⁶⁸

12.9.3 Online Periodicals Distribution

Online newspapers started in 1982, when 11 major US newspapers made portions of their print editions available to consumers on the CompuServe portal. CompuServe charged users a hefty \$5 an hour for access to the papers, and modems could download content at the rate of 300 bits per second. Access to news that would cost about \$0.25 in print would thus cost more than \$30 online. In 1993, the *San Jose Mercury News*, located in Silicon Valley, was the first newspaper to put its news content and classified ads online (on AOL) in its entirety.

When newspapers first began to be available on new technology they were accessed from desktops, then from laptops, and subsequently from mobile phones and tablets. One of the most prominent tablets is the Apple iPad, introduced in 2010. For newspapers sold for iPads through Apple's con-

tent retailer iTunes, prices are freely set by publishers. Apple keeps 30% of the revenue.

As a result of new technologies and systems, advertisement revenues for all newspapers in the USA dropped greatly. Sites such as eBay and Craigslist provided classifieds at lower costs than newspapers. Newspapers lost their hold on important categories of ads.¹⁶⁹

Although dismissed as old fashioned, paper-based publications such as newspapers, magazines, and books still carry several advantages. They are easy to use, portable, have high-contrast text, full-resolution graphics, zero power consumption, durability, flexibility, and a permanence for archives.¹⁷⁰ That said, online publishing brings many other advantages to distribution. Most obviously, without paper the distribution cost drops while speed and range rise. In 2008, it cost the *New York Times* twice as much to print out copies for its readers than it would have done to send them all an Amazon Kindle for nothing.¹⁷¹ Digital distribution has other advantages. It facilitates interactivity and targeted advertising, and it can collect demographic or geographic information on users, or on their behavior. There are no production overruns or under-runs, because the distribution model shifts from push to pull; and the need for warehousing, distribution centers, and trucks is eliminated. But the product changes, too. There is a continuous update of content; content can be customized to fit readers' preferences; there is interactivity among readers and the publication; targeting is possible for advertising. There can be multimedia content, "hypertext," sound, animation, and video. Other advantages of online text publishing are:

- links to other information and organizations;
- interactivity of readers with writers and editors;
- interactivity of readers with each other;
- variable size font helps readers with poor eyesight;
- accessibility from almost anywhere;
- continuous update of content;
- no more need for warehousing and distribution centers;
- shorter time-to-market;
- multimedia content—"hypertext," color, graphics, sound, animation, and video, all updatable.

There are disadvantages to online text publications too: technical glitches, network congestion, privacy, issuer, hardware requirements, and the need for continuous website maintenance. The glut of such information also depreciates credibility, and pushes publications to be both more sensationalist in content and less thorough in editing and fact-checking.

But by far the hardest aspect of the move to online provision is the much greater competition, coupled with the dif-

166 Sweney, Mark. "Netflix to spend \$3bn on TV and film content in 2014." *The Guardian*. February 5, 2014. Last accessed June 29, 2017. ► <http://www.theguardian.com/media/2014/feb/05/netflix-spend-3-billion-tv-film-content-2014>.

167 EDGAR Online. "Netflix INC." January 29, 2015. Last accessed June 29, 2017. ► <http://files.shareholder.com/downloads/NFLX/850278223x0x826035/b69e6840-a84e-425e-9ea3-a0ff4c507e58/SEC-NFLX-1065280-15-6.pdf>.

168 McAlone, Nathan. "Amazon will spend about \$4.5 billion on its fight against Netflix this year, according to JPMorgan." *Business Insider*. April 7, 2017. Last accessed June 29, 2017. ► <http://www.businessinsider.com/amazon-video-budget-in-2017-45-billion-2017-4>.

169 Starr, Paul. "Goodbye to the Age of Newspapers (Hello to a New Era of Corruption)." *The New Republic*. March 4, 2009. Last accessed June 28, 2017. ► <https://newrepublic.com/article/64252/goodbye-to-the-age-newspapers-hello-new-era-corruption>.

170 Wells, Alison. "Exploring the development of the independent, electronic, scholarly journal." *Information Research* 5, no. 2 (January 2000).

171 Carlson, Nicholas. "Printing The NYT Costs Twice As Much As Sending Every Subscriber A Free Kindle." *Business Insider*. January 30, 2009. Last accessed July 8, 2010. ► <http://www.businessinsider.com/2009/1/printing-the-nyt-costs-twice-as-much-as-sending-every-subscriber-a-free-kindle>.

difficulties around monetizing content. Although people still want to get the news, paying for it is no longer necessary. People refuse to pay for news and articles because the competition between various outlets for viewers or readers drives down the prices to or to near zero. Only the most powerful and leading brands are able to charge for content.

Scholarly journals are the most vulnerable to a collapse in price. This is because of their bizarre economics. Each year, an estimated 2 million scholarly articles are published. Content is written, edited, and selected by academics for nothing. In many cases, these articles are published by commercially owned for-profit journals, and are then bought by university libraries for high prices. An annual subscription to the *Journal of Brain Research*, which comes with a package of other journals about neuroscience, cost \$15,203 in 2000, up 50% from 1995. *The Journal of Comparative Neurology* cost \$13,900. The price of this subscription increased to \$27,465 in 2010 in the aftermath of the journal's purchase by a large commercial publisher,¹⁷² and to \$31,819 in 2017. A combination of both print and online access is priced at \$38,303. Journal expenses account for 70% of the average academic library's budget for materials, with \$500 million on journals annually in the USA alone.

12.9.4 Books Online Retail Distribution

Ebooks have been around for some time, at first unsuccessfully. Some examples of the early reading devices were the Knight-Ridder NewsTablet, the Sony Discman, the Rocket Book, and the E-Book. In 1998, Softbook appeared on the market, enabling customers to download titles from Softbook at 20–25% less than list price. The price for the reader with a black and white touch screen was \$200 plus \$10–\$20 per month with reading material for two years. In 2010, Apple introduced a new line of tablet computers, the iPad, which became wildly popular.

Phones, too, became a popular platform for ebooks, especially in Japan. Mobile phone novels, known as *keitai shousetsu*, first emerged in that country in 2003. These novels were sent through text messages to readers. They cater primarily to young females, and feature unconventional orthographs, emoticons, symbols, punctuation, and script choice common in youth colloquial speaking and typing styles.¹⁷³ The first cellphone novel, *Deep Love*, by Yoshi, tells the story of a teenager who contracts AIDS from “enjo kosai” or “compensated dating” in other words, prostitution. The Starts Publishing Company took advantage of the popularity of *Deep Love* to churn out a manga, a television drama, a film, and a series of novels that have sold millions of copies.

Novels have helped bring Japanese publishing back to life, after shrinking by over 20% in the decade after 1996.¹⁷⁴ In 2007, four of the top five literary bestsellers in Japan were cellphone novels.

12.9.5 The Business Models of Book E-Distribution

In 2014, Amazon had a 65% market share of the US ebook market, Apple had 10%, and Barnes & Noble 15%.¹⁷⁵ The companies followed different business and pricing models. As mentioned in Apple's agency model, the publisher sets the end price and the e-retail platform gets a percentage of the sale price. In contrast, in Amazon's wholesale model, the online retail platform is free to price above (or below) the wholesale price charged to it by the publisher. The publishers have control over the price to the consumer. Apple has a revenue split, where it keeps 30%, the same as for music. Bertelsmann's Random House did not sign on, deeming a 30% split too high. Apple's agency model was challenged on anti-trust grounds since it prevents retailers from offering price discounts to consumers.¹⁷⁶ Apple, it was argued, became part of this de facto collusion among the major publishers to protect such a non-competitive system and to force Amazon into it.

But the wholesale model, too, has resulted in anti-trust problems, leading one company (Amazon) to obtain a high market share. Amazon and Barnes & Noble both concluded that the price of an ebook should be between \$3 and \$10. They pushed publishers toward that price range by offering a more favorable percentage of the list price. At the bottom end publishers cannot sell an ebook for less than \$1. Amazon has two tiers. For list prices in the desirable range between \$3 and \$10, the publisher receives 70% of the list price, minus the delivery fee. When the list price is below \$3 or above \$10, the publisher receives only 35% of the list price.

12.9.6 Direct Electronic Distribution to Users: Streaming Music

Streaming audio technologies allow users to listen to music or view videos but restrict them from storing the music. In 2008, Apple's iStore surpassed Wal-Mart to become the #1 music retailer in America. Other online download services in the USA were Rhapsody, Buy Music, Napster, and Yahoo Music Jukebox. Each had millions of songs available for downloading. Pure streaming requires users to be connected. Companies offered subscription plans of around \$10

172 English, Ray and Larry Hardesty. “Create Change: Shaping the Future of Scholarly Journal Publishing.” *C&RL News*. June 2000. Last accessed June 4, 2012. ► <http://www.ala.org/acrl/issues/scholcomm/crlnews/crtechange>.

173 Coates, Stephanie. “The Language of Mobile Phone Novels: Japanese Youth, Media Language, and Communicative Practice.” *ASAA*. 2010. Last accessed June 27, 2011. ► <http://asaa.asn.au/ASAA2010/papers/Coates-Stephanie.pdf>.

174 Goodyear, Dana. “Letter from Japan: I ♥ Novels.” *The New Yorker*. December 22, 2008. Last accessed June 29, 2017. ► <http://www.newyorker.com/magazine/2008/12/22/i-love-novels>.

175 Eduardo Angel. “The current and very messy state of digital publishing.” January 8, 2015. Last accessed June 29, 2017. ► <http://www.eduardoangel.com/2015/01/08/the-current-and-very-messy-state-of-digital-publishing/>.

176 The publishers lawsuit was *U.S. vs. Apple et al* 12 Civ. 2862.

per month. Major music streaming services are Pandora (an early internet radio leader), Spotify (a major provider in Europe), and iHeartRadio (from the largest US radio station group). By 2017 streaming audio accounted for 15% of all audio sources in the USA; of this Pandora had a 30% market share, about 4.5% of all US radio listening.¹⁷⁷

The online music industry has a unique, Catch-22 situation: the more successful it is with users, the more money it might lose. The online music sites pay a license fee to the copyright holder each time a song is played. On the other side of the ledger, subscription revenue is a much smaller business. The gap is partly filled by advertising dollars, but that revenue is still small. In 2011, online radio had about \$800 million in advertising in the USA, compared with traditional radio's \$15.7 billion. 2017 revenues were about \$4 billion. Growth was 20% per year before 2011 and about 13% after 2014.¹⁷⁸

Looking at the music service Spotify, we can observe its economics: in 2016, it streamed about 30 billion songs per month.¹⁷⁹ 30% were interactive and 70% non-interactive.¹⁸⁰ In 2016, Copyright Royalty in America set new royalty rates for non-interactive streaming services. For a paying (i.e. subscribing) user the rate is \$0.0022 per stream; for a non-paying customer, the rate is \$0.0017 per stream. For interactive streaming, Spotify has to negotiate with the labels and non-signed artists. Spotify reported paying \$0.006–\$0.0084 per stream.¹⁸¹ The royalty payment is then \$35.7 million per month for 21 billion songs per month for the non-interactive streaming, or \$428.4 million per year. For the interactive streaming, assuming a \$0.0072 per stream royalty which is the median rate, the royalty payment is then \$64.8 million per month for 9 million songs per month, or \$777.6 million per year. This would lead to a total royalty payout of \$1.2 billion per year. If royalty payments account for 60% of cost, Spotify would need to generate \$2.0 billion per year in the USA just to cover costs. Spotify would require 11.1 million paying subscribers in the USA at \$15 per month to achieve this targeted annual revenue, about 22% of its worldwide base. Alternatively, running 100 billion audio ads at \$20 per CPM (which outside the USA would be quite high for radio-type ads) would bring the same annual revenue. At the reported 30 billion streams per month, this would mean an ad would be broadcasted every 3.6 songs.

Streaming usage has migrated to mobile and vehicles. 70% of Pandora's listening is via smartphones. The vast

majority—maybe 80%—of traditional radio listening is done while driving. In consequence, Pandora has negotiated deals so that its apps are preinstalled in the control panels of several major vehicle brands. Spotify opened its API to third-party app developers. Early apps included those of *Rolling Stone* and music-related services such as concert tracker Songkick. Advertisers can interact on Spotify with users through the apps.

12.9.7 Online Videogame Retail Distribution

The largest online retailer of video games worldwide by far is Steam. It was started in 2003 by game production studio Valve as a way to push out updates of its games to users. It has subsequently evolved into distributing games by outside developers. In 2018, Steam offered over 8000 games and had over 150 million registered accounts.¹⁸² Steam keeps 15–30% of retail price, depending on whether the producer is a major game house or an independent producer. In China, the major online distributors of video games are 37Games and Tencent Games.

12.10 Distribution Channel Strategies

Managers of media distribution must deal with these issues:

- self-distribution versus third-party distribution;
- the selection of distributors;
- the timing and sequencing of distribution over various platforms.

12.10.1 Self-Distribution: Customer-direct Distribution by Producers

In general, direct producer-to-consumer sales avoid sharing revenues with retailers and wholesalers. But they also reduce an understanding of the needs of local markets and lose the grassroots promotion of a retailer. In other cases, a direct relationship creates a bond. The internet enables musicians and authors to use direct-to-fan distribution to sell their work. Some of them are well known, such as Radiohead or Stephen King, who at times market their “brand” without a need for intermediaries. (It should be noted that they achieved their brand recognition inside the traditional system, and with the support of its conventional marketing operations.) This avenue will not be easily available to unknown artists. To develop audiences they need self-promotion, word of mouth, and sheer luck. While some such efforts snowball and receive much attention, the probability of success is minuscule.

For artists to go directly to audiences does not mean that there are no intermediaries. It is, of course, possible for an artist to have her own website and get paid for downloads or

177 Owen, Laura Hazard. “Left on the dial: With young people trading AM/FM for streaming, will radio find a home in your next car?” *NiemanLab*. April 18, 2016. Last accessed June 30, 2017. ▶ <http://www.niemanlab.org/2016/04/left-on-the-dial-with-young-people-trading-amfm-for-streaming-will-radio-find-a-home-in-your-next-car/>.

178 Kinsella, Bret. “Mobile Advertising Growth will boost Internet Radio Revenue.” *Xapp Media*. May 3, 2016. Last accessed June 30, 2017. ▶ <https://xappmedia.com/mobile-advertising-growth-boost-internet-radio-revenue/>.

179 Dredge, Stuart. “Spotify Now Processes ‘Nearly 1bn Streams Every Day.’” *Musically*. July 22, 2015. Last accessed June 30, 2016. ▶ <http://musically.com/2015/07/22/spotify-1bn-streams-every-day/>.

180 Users must be premium subscribers to be an interactive user (allowing the user to select which songs they hear). In 2016, Spotify had 100 million users, of which 30 million were premium subscribers.

181 Johnson, David. “See How Much Every Top Artist Makes on Spotify.” *Time*. November 18, 2014. Last accessed June 30, 2017. ▶ <http://time.com/3590670/spotify-calculator/>.

182 Edwards, Cliff. “Valve Lines Up Console Partners in Challenge to Microsoft, Sony.” November 4, 2013. Last accessed June 10, 2015. ▶ <https://www.bloomberg.com/news/articles/2013-11-04/valve-lines-up-console-partners-in-challenge-to-microsoft-sony>.

streaming, and perhaps also have advertising on that website. For performers, the internet permits direct-to-fans sales. An example is the comedian Louis CK, who has been called “The king of direct-to-consumer sales.” He sells his standup special for \$5 a copy on his website. About 200,000 copies were brought in 12 days. He also bypassed the Ticketmaster online ticket agency and instead offered the tickets to his shows directly on his website. He sold 100,000 tickets in two days, grossing \$4.5 million. More likely, however, is for the artist to place the music on aggregator sites such as Apple’s iTunes (for sale) and Apple Music (streaming) or Google’s YouTube (for streaming) and Google Play (for downloading).

Another level of intermediary is provided by services that manage placement on the various music sites around the world, collect the royalties, and distribute them to the artist. Such intermediaries include (for music) Bandcamp, Café Press, CD Baby, Artist Board, Constant Contact, Nimbit, Pledgemusic, Official.fm, and TuneCorp.

These services charge for their work as distributors. Last.fm takes a flat \$5 monthly fee no matter how many sales occur. Bandcamp takes 15% of sales up to \$5000 and then drops to 10%. CDBaby charges a 9% commission on the net payout to the artist after Apple’s 30% cut by iTunes, that is 6.3% of the retail price. Thus the net revenue left to the artist from the sale of her album selling on iTunes for a typical \$9.99 is about \$6.36, which is considerably higher than for an album sold as a CD at \$15, of which the artist may get about 10%, which after a number of deductions might add up to \$1 per sale. On the other hand, the number of copies sold by the artist on her own might be much smaller, since she does not have the label’s brand reputation and costly marketing apparatus behind her.

Does self-distribution work in economic terms for artists? Let us look at the numbers. Suppose one artist distributes her music in the traditional way through a major record label, while another artist uses the aggregator TuneCore to distribute content. On average, the second type of artist earns \$214 per year, or \$18 per month. This is because 94% of digital tracks sell under 100 copies and 32% of them sell only one copy.¹⁸³ The top-earning 1% of artists on TuneCore made an average \$935 per month, while less than a hundredth of 1% of artists made more than \$22,000. Three artists (one in 165,000) earned more than \$100,000 from digital music sales.¹⁸⁴ In contrast, Universal Music Group has 934 artists under contract. On average, these artists make \$15,000 per month from digital music sales, which is about 830 times the amount an independent artist makes on average. Of course, Universal Music Group signs only a very small number of artists, those with strong sales potential, and then promotes them and gives their work a strong distribution.

A second revenue stream for self-publishing artists—music and blogs—is online advertising. Google YouTube sells ads through multiple streams. Those ads are then matched up to content and served when a user clicks on the video. The contributor of the content is compensated based on the advertising earnings brought in through views of their videos (i.e. how many people click on their video and watch the ad, and how much Google makes by selling the ad, since different ads sell for different amounts). Ads are selected to be served to a music video based on numerous decisions by Google’s algorithm, including the content of the video (if it is compatible with a particular brand), the demographics of the user watching the video, and whether there are any copyright issues.

12.10.2 The Selection of Distributors

One strategy for a producer is to seek a wide distribution by as many distributors as possible. The idea behind such “saturation distribution” is that the more outlets and platform stock the product the greater the chance of it being bought. But in that case the distributors, whether wholesale or retailers, are likely to compete with each other and thus will end up with limited volume and profit margins. The other extreme is “exclusive distribution,” with a small number of intermediaries who then fully commit to the product. Their exclusivity gives them higher profits, but their presence across the market is limited and the lack of alternative distributors may lead them to be less than fully energetic. Furthermore, having exclusivity, they might exert power against the producer. An intermediate option is “selective distribution” with a relatively small but non-exclusive number of distributors.¹⁸⁵

When selecting distribution intermediaries, a company will look at several factors. These could include:

- track record;
- commitment of distributor to other and possibly competing products;
- financial position;
- ability to innovate and use new techniques.

The producer, too, must be careful to motivate and incentivize the distributor. Actions that might backfire are:

- producer bypassing distributor by selling directly to customers, possibly at a lower retail price;
- oversaturation of market by engaging numerous distributors;
- creation of new channels;
- engagements with cost-cutters.

It is almost unavoidable that there will be some competition among retailers and among wholesalers. This is known as channel conflicts. There are several types:

- Horizontal competition occurs between intermediaries of the same channel, such as rival video games stores.¹⁸⁶

183 HypeBot. “You’re Losing Money: Why The Majority Of Artists Should NOT Use TuneCore.” November 18, 2013. Last accessed June 30, 2017. ► <http://www.hypebot.com/hypebot/2013/11/youre-losing-money-why-a-vast-majority-of-artists-should-not-use-tunecore.html>.

184 TuneCore. “TuneCore Artists’ Music Sales – July 2011.” November 22, 2011. Last accessed June 30, 2017. ► <http://www.tunecore.com/blog/2011/11/tunecore-artists-music-sales-july-2011.html>.

185 Palmer, Adrian. *Principles of Marketing*. (New York: Oxford University Press, 2000), 337.

186 Palmer, Adrian. *Principles of Marketing*. (New York: Oxford University Press, 2000), 337.

- Intertype competition is between different types of intermediaries, such as video games stores and large department stores that retail video games.
- Channel system competition is an arrangement where an entire channel type is competing against a different and parallel channel, such as video game retailing by stores with the online downloading of video games.

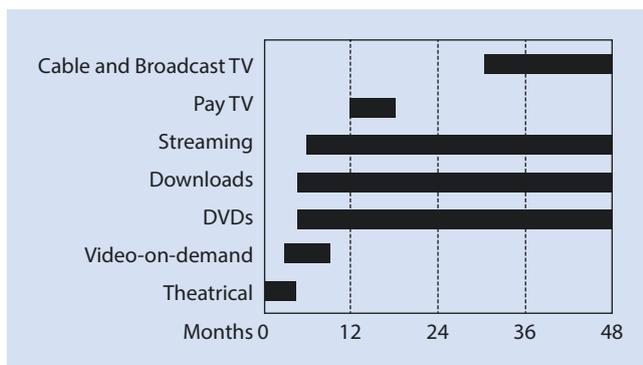
12.10.3 The Timing and Sequencing of Distribution over Various Platforms

Often the producer will separate different distribution channels by assigning them different geographic territories or customer classes. Another segmentation is by the time for their distribution activity. For film, this is known as windowing (■ Fig. 12.18). A film will be shown first in movie theaters. At the conclusion of the theatrical run, it will become available for sale for home movie viewing, and next by on-demand streaming for subscribers of video services. This continues until the film, having exhausted all other distribution options with a higher revenue potential, eventually ends up on late-night TV on small TV stations.

As mentioned, the basic principle for release sequence strategy is to:

1. segment the market by distribution platforms;
2. distribute via the platform that generates the highest marginal revenue per time unit;
3. cascade down in the order of marginal-revenue contribution.

Creating a release sequence is a form of price discrimination. To be able to maintain it requires keeping the various distributions and their channels separate from each other so that arbitrage does not become possible. Unauthorized use and sale undermine the ability to maintain this system. One impact of increasing piracy therefore has been the compression of the release sequence in order to shorten the time window for pirates before the film is available more cheaply than in theaters. Another response is to release films internationally at the same time as they are released in the USA, so as to



■ Fig. 12.18 Typical distribution windows from release date, c. 2014

give pirates less time to flood international markets. The film *The Perfect Storm* opened internationally a few days ahead of its US theatrical opening. However, early international release reduces the positive impact of favorable US press stories and performances. Moreover, marketing campaigns traditionally have the director and stars of a film visit each major country as their film is about to be released. This becomes harder with global release dates.

The theatrical run of a movie is usually over within a window of three months. The home video is released about six months after the theatrical run. Spacing too closely cannibalizes the high-margin version, because some potential viewers will wait. But delaying too much results in a loss of the market awareness of the film and its image as “new.”

What is the optimal length of the theatrical window? When to release a film in a second channel such as for home video rentals? This can be analyzed as a scheduling problem. The success of the film in the first channel (theaters) helps predict sales in the second channel (video rentals), and to set strategy for that second channel. When the second channel is activated, however, it draws business away from the first channel which has higher margins. Thus there is an optimal point at which one would diversify distribution with a further channel. This is discussed by marketing theorists in a variety of analytical papers.^{187, 188}

12.10.4 Retail Distribution: Conclusions on Trends

While there are always exceptions, the broader trends in retail distribution are as follows:

- Bricks and mortar retailers are declining:
 - video rental stores are dead;
 - music stores are dead;
 - bookstores and game stores are in decline;
 - film theaters are squeezed.

Consolidation of retailers into large chains. Massive consolidation into chains can be observed for:

- books: Barnes & Noble (USA), W.H. Smith (UK), Kinokuniya (Japan), Hugendubel (Germany), Payot (Switzerland), Steimatzy (Israel), and so on;
- music (before bankruptcies): Tower Records;
- video rentals: Blockbuster (before bankruptcy), Redbox;
- film theater chains: Regal (USA), Gaumont (France), Silverbird (Nigeria), Cinopolis (Mexico), PVR (India), Toho (Japan);
- video games: Valve;
- consumer electronics: Best Buy (USA), Best Denki and Deodeo (Japan), Media Markt (Germany).

187 Lehmann, Donald R. and Charles Weinberg. “Sales through Sequential Distribution Channels: An Application to Movies and Videos.” *Journal of Marketing* 64, no. 3 (July 2000): 18–33.

188 Prasad, Ashutoshm, Bart Bronnenberg, and Vijay Mahajan. “Product Entry Timing in Dual Distribution Channels: The Case of the Movie Industry.” *Review of Marketing Science* 2, no. 4 (2004): 1–18.

The consolidation into chains is part of a larger move to national-brand “big box” store chains that exist everywhere, from groceries to auto repairs to restaurants. The trend weakens traditional mom-and-pop retailers. The next disruptive change has been online retailing, often the *coup de grâce* for bricks and mortar stores, whether small or large, unless the smaller retailers can develop an additional value-add for the end user.

- Replacement of physical products by digital products leads to leapfrogging of traditional retailers byetailers:
 - Netflix for video streaming;
 - Apple iStore for music and ebooks;
 - Amazon for ebooks;
 - Steam for games.
- While many distribution chains show an integration of wholesaling and retailing, in other distribution chains the opposite is happening.

For music, books, video games, or consumer electronics, the emergence of large chains and/or of electronic distribution has led to a compression of the distribution channels, with the wholesale and retail functions often combined. In some cases, they are also integrated with that of the producer. Examples are Apple’s and Microsoft’s retail stores, or Time Warner’s HBO Now. On the other hand, there has also been a disintegration. In the film industry, the producer companies used also to be wholesale distributors and retailers (theaters). Today, film retailing in the USA is quite separate from distribution, though legally it can be joined again. Much of film production, too, is separate from distribution, though closely related by financing.
- Book retail distribution tied to publishers, such as Bertelsmann’s book club, has declined considerably.
- A trend from discrete products (a film, a CD) to bundled (subscription) services:
 - music (Pandora, Spotify, Tencent);
 - video (Netflix, Hulu, Amazon);
 - newspapers and magazines (decline of street sales in favor of subscriptions).
- There is also a counter-trend to unbundling:
 - VOD instead of pay-TV subscriptions;
 - single music tracks instead of albums;
 - film streaming services instead of cable TV bundles of channels.
 - Some subscription models have declined, in particular book and music clubs, and more generally newspapers and magazines.
- Online retailers tend to be large and dominant, even more so than retail chains:
 - books (Amazon);
 - film rentals (Netflix, Amazon);
 - music (Apple iStore);
 - games (Steam, Green Man Gaming (UK), Tencent (China));
 - everything (Alibaba, Amazon).

- Dominant online retailers tend to be new retailers.

(All of the examples above are new companies.)

- Direct-to-consumer retailing by producers has not been a major factor.

Can we observe producers becoming retailers? Yes. In many media, the producers (even the creators) can access the end user directly. Many music labels or artists run websites that stream content. Book, magazine, and video games publishers permit direct purchases. There has been a large number of self-produced and self-marketed videos. However, the actual volume of business and of transactions is smaller than the publicity it received.

- The revenue share of retailers in overall media revenues of the industry averages 23%. It is 25% for physical content media, 21.4% for electronic content media, and 19.3 for online media. It is higher where:
 - a major local effort is involved (film theaters, 40%);
 - major investments are needed (cable TV, 33.5%);
 - large inventory is necessary (books, 40%);
 - products are perishable or risky.

- The retailing stage is resilient.

The shift away from traditional retailers moves economic activities to new types of retailers (e-tailers), not to disintermediation of the retailing function. The resiliency of the retailing stage is based on its ability to transform itself. In several segments of the media and information sector, the retail sector has been the one that has changed the most. Examples are the music business and the video/film industry. The persistence of retailing (albeit in new forms, often integrated with wholesale distribution) suggests that retailing has a role regardless of the distribution technology used.

Elements of this role of retailing are:

- screening and validation of products;
- customer service;
- transaction management;
- inventory storage;
- local market analyses;
- local marketing;
- creating a shopping experience;
- consumer credit;
- comparison shopping among many brands and products—a shopping mall rather than a factory outlet.

The relative lack of success of producers—whether large or tiny—to become retailers also suggests that the respective skill sets are different. Retailers are sales and marketing oriented, which are people-oriented tasks. Producers are technology and content oriented. Both stages require a good dose of effective logistics management, which is an operational function.

The emergence of strong retailers creates countervailing power against large producers or wholesale distributors. Thus, whereas in the past retailing was characterized by small independents who were fairly weak, today Apple and

Amazon can dictate pricing arrangements to book publishers and music labels. Similarly, Netflix has power facing the Hollywood studios, and Apple can impose conditions on app developers for the iPhone. If anything, the retailer, especially when integrated with wholesale, as all the above examples are, exert so much bargaining power that the producers agitated for regulatory/government assistance in curtailing it. In the past, it was the retailers who sought such protection.

12.11 The Revenue Shares in the Distribution Chain

After our explorations of the wholesale and retail stages of the distribution chain, we now turn to the relative shares of revenues for the participants in the entire chain. Some of this was interspersed into the previous discussion. Where are the profits in the value chain? ■ Table 12.7 is based on the analyses of this

■ Table 12.7 The revenue shares in the distribution chain

| | Retailer (%) | Distributor (%) | Producer (%) | Creator (%) |
|---|--------------|--|--------------|-------------|
| Film Theatrical distribution ^a | 40 | 45 | 16 | 11 |
| Film Pay cable distribution | 33.5 | 38.5 | 20 | 8 |
| Film Broadcast TV distribution | 22 | 46 | 22 | 10 |
| Film Online distribution | 25.8 | 20 (National Distribution) 4.7 (Local ISP) 24 (Advertising Intermediaries) | 20 | 5 |
| Film Home video store chain distribution | 25 | 50 | 17 | 8 |
| Books (print) | 40 | 12.5 | 35 | 12.5 |
| Ebooks | 30 | – | 53 | 17 |
| Music CD | 20 | 17 | 46 | 17 |
| Online music | 25 | 8 (National Distribution) 5 (Local ISP) 18 (Advertising intermediaries) | 28 | 16 |
| Magazines (including advertising subscriptions) | 16 | 8.5 | 68 | 7.5 |
| Online magazines (including advertising) | 13 | – | 67 | 20 |
| Print newspapers (including advertising revenues ^b ; adjusting for the prevalence of direct subscriptions) | 13 | 9.5 | 62 | 15.5 |
| Online newspapers free (including advertising) | 3 | 23 (Advertising intermediaries) | 44 | 30 |
| Online newspapers by subscription (including advertising) | 15 | 20 (Advertising intermediaries) | 45 | 20 |
| Consumer electronics | 25 | 20 | 45 | 10 |
| Physical content media | 25 | 23.1 | 40.1 | 11.4 |
| Online content media ^c | 19.3 | 5.5 | 58.2 | 18 |
| Electronic content media | 21.4 | 14.7 | 48.9 | 15.8 |
| All Media | 23 | 18.3 | 38.5 | 13.1 |

^aTheatrical deficit is a loss leader for subsequent distribution on other platforms.

^bWhile retailer's share in single-copy sales is much higher, most of newspaper revenues come from advertising and subscriptions, in which retailers do not share

^cExcluding advertising intermediaries.

chapter, plus interviews with participants in the various industries. They show the share in the overall revenue of a media product by the four major stages of a media production and distribution: creation, production, distribution, and retailing. We identify their share in the money consumers and advertisers paid. This share is net of payments that was kept rather than passed on to the other stages. It is not net of the other various expenses which each stage incurred. For example, of the 62% of newspaper revenues that go to the publisher, 14.7% are used for materials (paper), 18% for the actual production (printing, etc.), 6.3% for general administration, and 10.5% for marketing and promotion. 12.5% is profits. For more details, see the Appendix.

What can we observe from this table?

- The share of overall revenues that goes to the creators is invariably small and hovers around 11–15% for most media. It is highest for online media at 18%, though that is partly a function of the small role of wholesalers in that sector. It is actually highest for the newspaper industry, which reflects its labor-intensive nature. It is lowest for film, where much of the revenue goes to theaters, producers, and distributors.
 - The share of revenues that goes to producers averages 49%, by far the highest share. It is highest for magazines and newspapers, where it reaches 68% and 62%, including the advertising revenues. It is high for electronic content media (48.9%) and lowest for film (19%), where most of the revenue goes to the distributors. It must be understood that these revenues do not mean share of profits. The producers of media bear some of the major costs. For newspapers and magazines, for example (beyond the cost for editorial/creators), publishers must pay for paper, printing, solicitation of advertising, marketing of the publication, overhead, and so on. If we look at profitability, profits for book publishers are 7.8% of overall retail revenue, magazine and newspaper publishers 12.5% (2% for advertiser-supported online publishing), music labels 6% (and less for online music), and consumer electronics makers 5%.¹⁸⁹
 - The share of the distribution chain covers much of the rest. Wholesalers average 18.3%, as has been discussed earlier in this chapter. It is much higher for film (39.9%) and lower for books (6.3%), magazines (3.8%), newspapers (2.2%), and online media (5.5%). It is larger where marketing activities must be extensive, investments are high, and risk great. It is higher, by 57%, for physical content media than for electronic content media (23.1% versus 14.7%), and both are much higher than for online media (5.5%), where wholesale operations are less important and are integrated with retailing.
 - For retailing, the revenue share averages, as mentioned, 23%. It is higher (25%) for physical content media, 21.4% for electronic content media, and 19.3% for online media. It is higher where local marketing efforts are high, inventory requirements great, and risk high.
- If we look across all media, the revenue share of the distribution chain is about 41%. It is lowest for online media at about 25% and highest for physical content media (48%). This reflects the higher cost for physical distribution over online distribution, but also the greater market power that prevails.

12.12 The Impact of Distribution on Content

12.12.1 Distribution and Content

We are on the verge of truly exciting changes in the way we create and consume culture and information. This enrichment of media content will inevitably lead to new genres and styles. There is a relation between media technology and content. Marshall McLuhan, the 1970s media guru, is known for the aphorism “the medium is the message”—that is, distribution technology defines content style. He argues that “We shape our tools and thereafter our tools shape us.”¹⁹⁰

Visual images are composed of a huge number of information units. Digital technology expresses information elements as “bits”—binary information. The cheaper it becomes to produce bits and to distribute them, the more visual the medium becomes. Weaker visual capability favors story line and character development dialogue. Higher visual capability favors special effects, adventures, and action. Before photography and film, the major medium was print. The print medium was expensive in distribution and hence parsimonious in its use of “bits.” It generated extraordinarily subtle works—novels, poems—with each bit containing a lot of content. Film changed all that. Its cost of distribution per megabyte of information was much cheaper than that of print and thus it enabled an enrichment of the content. It could provide the visual details. Therefore, film could stretch imagery to levels that did not exist before. In less than ten years, film pioneered new forms of expression and new genres—science fiction, outdoor adventure such as Westerns, voyeuristic content.

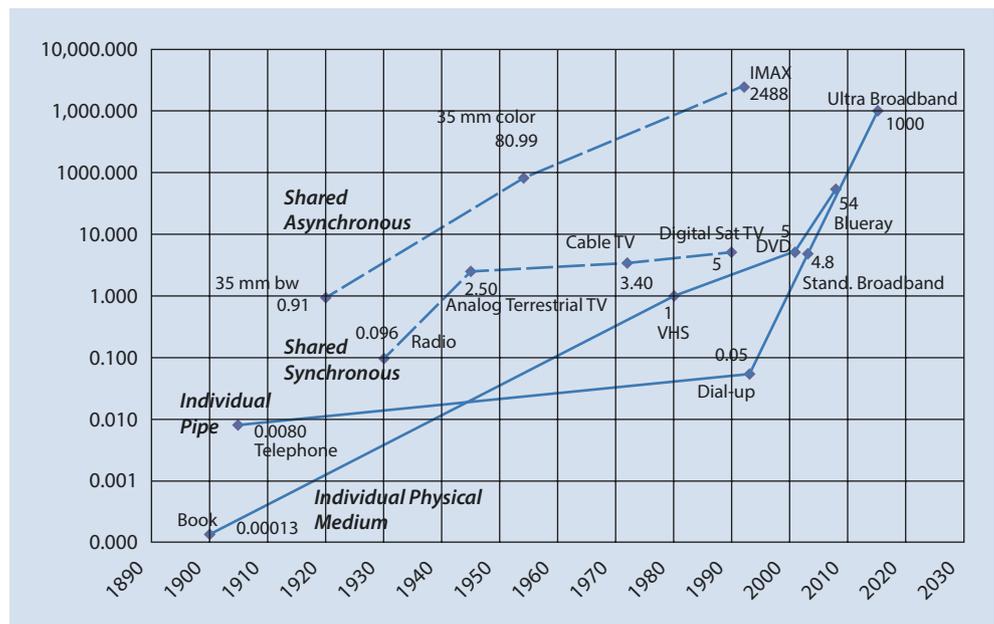
Early film was probably the most unobtrusive form of mass media expression ever. Since there was no sound, it had to rely on heavy-handed physical action. The plots were simple with simple characters. This was not just because of the technical limitations of the medium, but also because of the socio-economics of the medium. Because the film experience was cheap, it was affordable for the working class and the style reflected mass popular taste, not elite taste. In 1927, the first full-length movie with sound was released. It enabled real dialog, and in consequence films became subtler.

The second constraint was the cost of distributing these bits of content. In the first generation of television (broadcasting), there was a limited number of channels, and the high opportunity cost meant national, middle-of-the-road content. The second generation of TV was the multichan-

¹⁸⁹ These are not profit margins on producer sales, but margins on consumer prices. Since there are markups by wholesalers and retailers, the profit margins of producers are thus higher. See the table in the Appendix.

¹⁹⁰ As quoted in Culkun, John M. “A Schoolman’s Guide to Marshall McLuhan.” *The Saturday Review*. (March 18, 1967), 51–53.

Fig. 12.19 Trend of information enrichment of media



nel stage—Cable TV, DBS, VHS, and DVD. Cable enabled more channels because to distribute them did not require an audience of 20–30% of the population, as limited broadcast TV did. Very specialized content channels emerged, such as Baby First TV, the Boating channel, or Black Belt TV.

And now emerging is the third generation of TV: TV over the broadband internet. Bits have become still cheaper to create, manipulate, and transmit. This changes media in two dimensions: widening and deepening.

The widening of video distribution continues past trends:

- more TV channels;
- more regular TV, but at different times;
- narrower narrowcasting: long tail content;
- more imported channels;
- user-generated video;
- more distribution platforms, including mobile telecom (anytime, anywhere) and follow-me TV.

There is also a second dimension of change: deepening. This refers to a greater richness of media, that is, to the greater extensions of signals to sensory receptors such as eyes, ears, nose, skin, and mouth. It loads on human signal processing. More powerful and affordable distribution will lead to richer media and to media applications that operate with more “bits,” not just more of the same.

The dimensions of media richness will include, over time:

- better quality of picture, especially for larger screens;
- three-dimensionality;
- virtual reality;
- immersion;
- interactivity;
- individualization.

These elements will create video entertainment of an experiential nature, with user immersion, participation, and inter-

activity. This leads to entirely new types of content and its subcategories (genres):

- immersive films and games;
- sports immersion and simulation;
- marketing tools for experiencing products;
- travelogue experiences;
- participatory news (you are there);
- education and training simulation content;
- social immersive sharing;
- individualization of content: advertising and even plot lines customized to different individuals or user categories.

In our discussion of trends of distribution we observed that the price of creating information, as measured by the price of 1 GB of information, has declined enormously with the technology of production. We also observed, in the present chapter, the rapid and continuous decline in the cost of distribution of information over time. These two trends, taken together, have led to an enormous decline in the price of a bit of information delivered to the end user. Such a price decline leads predictably to a rise in consumption of bits.

If we identify the trend of major media technologies over the past century we can observe a continuous rise in bit-intensity per unit of time. This is depicted in Fig. 12.19, a semilog presentation of such growth. It shows a compound growth rate of about 8%.

Thus, with this trend of bit enrichment of media channels, what is the implication? What can we expect in terms of media and information if the bit rate of media continues to grow at that compound growth rate?

A medium of expression tends to start at a high cost per bit, and in that period of high cost it is first introduced and used by a few high-income elite users. Then the medium creates a system of shared usage. This lowers the cost for each user and it distributes the high fixed cost over multiple users.

12.13 · Conclusions

For example, theater, concert, and opera were used in shared consumption. Shared consumption is usually synchronous. However, costs decline over time and eventually move to a range where it becomes affordable for individuals. At that point, the medium starts to become individualized and asynchronous.

This means that by looking at present use of shared media, and assuming a certain rate of price decline per bit, one can predict the future individualized usage. What is affordable today only when we share the cost will become affordable individually in the future along a path that is reasonably foreseeable. And that means that we can predict the next individual content type from the existing shared communications style.

12.12.2 Implications for Media Distribution Companies

If people spend more of their lives inside and/or connected, media companies will get more of their time, attention, and money. This is, on the demand side, good news for these companies, whether they produce bits, distribute them, or transport them.

However, on the production side, a richer content also means a more expensive content. This is also a continuation of trends. And this has business implications for the structure of content production industries.

To produce such next-generation content is costly. It requires creativity, many programmers, and many new versions. For *Terminator 3*, \$20 million was spent on computer graphics alone. For *Avatar*, the main visual effects company Weta Digital had up to 900 employees working on the project. Weta used 3000 HP servers with 35,000 processors.¹⁹¹ Each minute of the film filled 17.28 GB of memory. *Avatar* consists of

40% live action and 60% computer generated/enhanced footage. It cost \$280–310 million to make the film. And this is only the beginning, since making the same linear content individualized, interactive, and immersive raises costs exponentially.

Such expensive content exhibits strong economies of scale on the content production side, and network externalities on the demand side. Both the content production side and the demand side favor content providers with big budgets who can diversify risk, distribute over other platforms, brand, deliver to large audiences, and coordinate specialized inputs.

On the other hand, long tail content can be supplied by everybody, through the lower-cost production and distribution technology. There is room for experimentation in content and technology. Some of this will be created by decentralized peers and non-profit user communities collaborating loosely with each other. When successful, these innovators typically are acquired, hired, or copied by major firms. What will emerge is a two-tier system of large integrator firms and a bevy of small and medium-sized specialist firms.

When it comes to news rather than entertainment, the trend will be to move from a model of wide audiences receiving relatively low relevance stories—mass media—to a model of small segments of people receiving highly relevant news—personalized media. Customizing content in a meaningful and accessible manner requires a comprehensive collection of information, a feat too great for any one newspaper. News organizations therefore will have to go beyond internally produced and compiled content. Instead, they must make connections with other newspapers, magazines, trade journals, newsletters, blogs, other non-traditional sources, freelancers, investigative journalists, and so on. In other words, the news organization becomes a network, an information distribution system for the user to navigate.

12.13 Conclusions

12.13.1 Case Discussion

The Role of Distribution in Bertelsmann's Future?

For Bertelsmann, one strategy would be to focus purely on content and drop distribution platforms (such as TV stations, media clubs, online streaming, etc.) as well as printing. Without distribution how would content be affected? Already, Bertelsmann's UFA films are being distributed mostly by others, and its music distribution, along with the rest of BMG, has been sold off. Its music and book clubs are in decline or have closed down. TV broadcasting is also declining in general. Bertelsmann's origin is in content publishing. Bertelsmann printing division is declining, along with printing more generally.

In the past, Bertelsmann controlled strong distribution channels in book and music clubs, and leveraged this into a strong role in book publishing and music labels. RTL TV licenses gave Bertelsmann a strong role in film and TV distribution and therefore production. But in online media, Bertelsmann's role in distribution declines, and with it the advantage for its own content.

The second strategic option is to focus on online distribution. But what has been Bertelsmann's track record been in creating online distribution?

- Music: it was far ahead of the rest of the music industry, but its deal with Napster was blocked.
- Film and TV online: online efforts had no noticeable impact.
- Books: bol failed. Tolino, and Skoobe efforts are noteworthy, but wield no real power in a consortium that includes all the major German book retailers in a joint alliance.
- Video Games: no presence.

The question then is:

- What can Bertelsmann do to strengthen its role in online forms of distribution?

¹⁹¹ Wikipedia. "Avatar (2009 film)." Last accessed July 8, 2010. ► http://en.wikipedia.org/wiki/Avatar_%282009_film%29.

12.13.2 Overall Conclusions on Distribution

In the media and information industry, the distribution of content and devices usually gets less attention than creation and production. However, it is a key skill in an environment of glut and multiple platforms and stages. Several trends are occurring:

- The rapid advancement of technology is driving the migration of media distribution to electronics.
- Distribution is moving from bulk to individualization.
- Distribution is becoming globalized.
- Convergence to IP is leading to the convergence to multipurpose platforms.
- The rising economies of scale in distribution is changing market concentration.
- The lowering of entry for applications and content is creating a greater dependence on distribution platforms.
- The technological and economic trends are transforming individualized electronic distribution from a kilobit stage of individual information to the megabit stage and soon to the gigabit stage.

One network principle—known as Amdahl’s Law—says that a system’s speed is determined by the slowest component in the data path (i.e. a convoy travels at the speed of the slowest ship). Another maxim—Drucker’s Law—states that profits migrate to the supplier of the missing component necessary to complete a system. (i.e. the bottleneck gets the profits). By combining the two, it seems that the most profitable segment is not necessarily the one most developed and innovative but the one most restricted. And that segment more often than not is the distribution stage of the value chain.

Distribution is restricted not because of technology—that is moving ahead rapidly. But rather, it is the fundamental economics of this change. We have seen that networks are characterized by economies of scale, economies of scope, network effects, and instability. And the trends increase these factors, which is why distribution networks are almost always highly concentrated in a few companies. Electronic networks are becoming more expensive in fixed cost and less expensive in marginal cost. This raises industry concentration. It is for that reason that we have market structures with six major film distributors, three music distributors, one infrastructure phone company, one local cable company, maybe two DBS firms, one local newspaper, two to three broadband internet providers, one satellite radio distributor and three or four mobile wireless providers.

As we have shown, it is not the absolute cost of distribution that determines the concentration of distribution networks. It is the relative cost of fixed versus marginal cost or fixed versus total cost that determines market structure.

Some distribution is becoming more open and less concentrated, since new technologies create shocks and upheavals to established players. But soon the fundamental economics of distribution will assert themselves with a high fixed cost and low marginal cost. In competition, prices will

plummet toward low marginal cost, which cannot support the high fixed cost. Companies go out of business, the survivors consolidate and establish an oligopoly that maintains prices at a higher level. Airlines, telecoms, and, historically, films and music are examples of these dynamics.

The analytical tools for managerial decisions and control are similar for physical and similar electronic distribution. They incorporate a tradition of engineering analysis, operations and logistics, business economics, and law. Of course they are not identical for different platforms. For example, electronic distribution is less secure and makes piracy easier. On the other hand, electronic distribution has stronger feedback, better consumer price comparison, and easier individualized price differentiation.

We return to the points we presented at the beginning of this chapter.

12.13.2.1 Myth #1: “Content Is King”

This is the cliché of the media industry sector. It believes that content is scarce and difficult, and that distribution is commodity. Relative power in the value chain is based on the relative scarcity of the stage.

The source of market power is distribution. And distribution, given its fundamental economics, tends to be inherently concentrated. Content has much lower entry barriers, and is not inherently concentrated. Distribution firms leverage this asymmetry into a role in content creation and content aggregation.

The main source of economic power of media firms is distribution. Distribution companies leverage this into a role in content creation and content aggregation. Vertical integration is the symptom, not the cause of market power in distribution. As the complexity of distribution rises, as FC/MC ratios rise, and as regulation is less effective, distribution becomes the key.

12.13.2.2 Myth #2: Technology Breaks Up Market Power in Distribution

Isn’t distribution becoming more open and less concentrated? More broadband internet, fiber networks, mobile communications, and cable channels?

New technology indeed creates new and more advanced forms of distribution. More advanced distribution technology means fewer bottlenecks but not less market power held by the distribution company. It could even become more powerful. As we discussed, technology is raising economies of scale and hence reduces the number of players and raises their market power.

12.13.2.3 Myth #3: Disintermediation

Retailers and wholesalers are needed and fulfill several essential functions. Producers’ direct business with consumers is fairly weak. There are new types of distributors, and some distribution stages become integrated, but the function does not disappear. On the contrary, the new distribution intermediaries are more powerful and central than ever.

12.13.2.4 Myth #4: Electronic Distribution Is Very Different from Physical Distribution, and Changes Everything

People often make a big distinction between electronic and physical distribution. But there are great conceptual, economic, structural, and organizational similarities. The new distribution technology changes network architectures, market structures, and the players. But the basic roles of distribution intermediaries—wholesalers and retailers—remain.

Given its fundamental economics, distribution is inherently concentrated. Content has much lower entry barriers and is not innately concentrated. Thus the main source of economic power of media firms is distribution.

In other words, for some types of media, content is king. But if so, then distribution is the emperor. It must be managed. It can be leveraged.

12.14 Review Materials

Issues Covered

In this chapter, we have covered the following issues:

- What the concept of distribution networks is.
- How network design affects economies of scale and market structure.
- How physical distribution is affected by electronic channels.
- How governments impact a firm's distribution business.
- Whether vertical integration of distribution and production creates synergies.
- What the various topologies and architectures of networks are.
- How different disciplines approach the analysis of networks.
- What the concepts are of guaranteed QoS versus best-effort work.
- How net neutrality regulations affect the internet.
- What the distribution systems for film, music video, and video games are.
- What the distribution systems for books, newspapers, and magazines are.
- How wholesaling and retailing can be vertically integrated.
- How electronic distribution affects print, music, and video.
- How to select distribution intermediaries.
- How to analyze release sequencing strategies over various platforms.
- The different stages in a distribution chain.
- What the trends are in wholesaling.
- What the trends are in retailing.

- What the revenue shares are for firms in the distribution chain.
- What the extent of disintermediation and consumer-direct distribution is.
- How inbound logistics is planned.
- The reasons why network competition is unstable.
- The various ways in which the broadband internet impacts traditional media distribution.

Tools Covered

We used these tools to address distribution issues:

- Social network theory
- Operations Research
- Queuing models
- Erlang network capacity analysis
- QoS analysis
- Distribution architectures
- FC/MC ratio
- Economies of scale of networks
- Derived demand curve with network effects
- Metcalfe's Law
- Shannon's Law
- Release sequencing models
- Economies of scope
- Network effects

12.14.1 Questions for Discussion

1. How are electronics changing physical distribution?
2. What are the parallels in physical and electronic distribution networks, and how will declining prices affect these networks?
3. How will the film industry change as various operations move toward electronic distribution?
4. Are the problems of volatility facing network companies today similar to those faced by other network industries? How did they deal with these problems?
5. Identify a non-media industry where the approach to distribution has changed dramatically over the last few years. What are the implications for suppliers to that industry?
6. List the criteria a content provider might use in selecting a channel intermediary.
7. In what media industries is JIT inventory management relevant, and for which less so?

8. Describe logistics management in consumer electronics.
9. Business managers and engineers both need to make economic decisions. As a business manager, how does the decision process differ from that of an engineer?
10. You are a manager at a large ecommerce company such as Amazon.com. Analyze the effect of a pull supply chain on your company.
11. What are the limitations of Metcalfe's Law?
- C. The number of lines necessary for a single user;
- D. The number of broken links in a network in one hour.
7. Which alternative is false?
- A. In a push supply chain, production and distribution decisions are based on long term forecasts;
- B. In a pull supply chain, production and distribution are demand driven so that they are coordinated with true customer demand rather than forecast;
- C. Push and pull systems allow the elimination of inventory and increase service levels;
- D. It takes longer for a pull-based supply chain to react properly to a changing marketplace.

12.14.2 Quiz

1. What is not a myth?
- A. Content is king (the scarce element);
- B. Technology reduces the market power in distribution;
- C. Electronic distribution is very different from physical distribution and changes everything;
- D. Electronic and physical distribution are organized around networks.
2. Which one is not a primary characteristic of telecom networks?
- A. Two-way;
- B. One-to-many connectivity;
- C. Individualized medium;
- D. Limited capacity.
3. What is the main problem of the "party line" ("bus network") architecture?
- A. Direct connection between every user and every producer pair;
- B. Vulnerable and congestible;
- C. Costly and underutilized;
- D. Can't be used to create ring networks.
4. What is not a conceptual similarity between electronic and physical distribution?
- A. Transport links;
- B. Nodes;
- C. Hierarchy;
- D. Wired links.
5. From the factors listed below, which one is the key factor in networks?
- A. Price deflation;
- B. Intangible products;
- C. High fixed costs, low marginal costs;
- D. Convergent markets.
6. What does the telecom network traffic volume measured in Erlangs represent?
- A. The continuous use of one line for an hour;
- B. The number of users in one line;
8. Which platform is not a broadband distribution option?
- A. Satellite;
- B. DSL;
- C. Dial-up modem;
- D. Powerline;
- E. Cable modem;
- F. Wi-Max.
9. Satellite delivery is very appealing for what reasons?
- A. Ability to reach far-flung areas;
- B. More secure than physical distribution of film;
- C. Centralized scheduling;
- D. All of the above.
10. Which of the following is not associated with network analysis?
- A. Shortest Path Problem;
- B. Queuing Theory;
- C. ROI;
- D. Maximum Flow Problem.
11. Given lead time (LT), demand (D), Q (initial quantity), n (number of cycles), reorder level (ROL) is:
- A. $D \times LT - (n - 1) \times Q$;
- B. $D - n \times Q$;
- C. $LT \times Q - n \times D$;
- D. $LT \times D - n \times Q$.
12. The key economic characteristics of communications networks are:
- A. Economics of scale;
- B. Economics of scope;
- C. Network effects;
- D. All of the above.
13. What is Metcalfe's Law?
- A. The total value of the network to all users, n , is proportional to $n \times (n - 1)$;
- B. The value of the network grows by the square of the processing power of all the terminals attached to it;

- C. The total value of the network to all users, n , is proportional to $(n - 1)(n + 1)$;
- D. The total value of network grows by the n th power of the processing power of terminals attached to it.
14. What are the implications of Shannon's Law?
- The stronger the signal, and the lower the interference ("noise"), the more information can be put on a transmission link;
 - The stronger the signal, and the higher the interference ("noise"), the less information can be put on a transmission link;
 - The stronger the signal, and the higher the interference ("noise"), there is no effect on the amount of information can be put on a transmission link;
 - None of the above.
15. VPN:
- Virtual public network;
 - Virtual private network;
 - Exists not as a physically separate network, but as part of larger existing networks;
 - B and C.
16. VoIP is possible between:
- PC and telephone;
 - Telephone and PC;
 - Telephone and telephone;
 - All of them.
17. The biggest obstacle in the widespread use of internet telephony has been:
- Lower quality and lack of defined communications standard;
 - Too much congestion on the Internet;
 - Phone companies began charging internet phone users for making long-distance telephone calls.
18. Investment in telecommunications networks in the future is likely to:
- Decrease, because most of the network has already been built;
 - Be more difficult, because capital suppliers will be warier of regulatory conditions and capital requirements;
 - Increase rapidly and exponentially, owing to high levels of demand for multimedia services.
19. Digital is more effective than analog for communications because:
- Digital signals can travel faster;
 - Analog signals cannot travel through walls;
 - Digital information has less degradation over distances.
20. Which of these statements on telecom history is incorrect?
- Samuel Morse built the first near-digital network;
 - Alexander Graham Bell's major advantage was that his technology was years ahead of his competitors;
 - The US telecom monopolist AT&T was broken up by a Supreme Court decision;
 - Japan, the EU countries, Korea, and others privatized their state telecom companies in the 1980s.
21. What is not another term for network effects?
- Network externalities;
 - Spillover effects;
 - Supply-side economies of scale;
 - Demand-side economies of scale.
22. What are current wholesale distribution trends?
- Replacement of a three-stage system by a four-stage one;
 - Decreasing market concentration in wholesale distribution;
 - Large retail chains don't deal directly with manufacturers/producers, and this increases the role of the wholesalers;
 - Expansion of distributors into content production.
23. What key economic factors shape distribution in the media industry?
- High fixed costs & low marginal costs;
 - High marginal costs & economies of scale;
 - Low fixed costs & low marginal costs;
 - Low fixed costs & high marginal costs.
24. What are business implications of network effects?
- A large network is less attractive to users and hence less competitive, all other factors held equal;
 - Larger networks don't add any value to the users;
 - Interconnectivity to large networks is not important to a small network, because this doesn't raise its value to customers;
 - The control to access to a large base of users can be a company's greatest asset.
25. What statement refers to the Tree-and-Branch distribution architecture?
- Topology that contains multiple distributors and multiple consumers;
 - The flow of information or of products is two-way;
 - The flow of information starts with a wide distribution pipe which then branches into increasingly narrower ones;
 - In this architecture every consumer is horizontally connected among various users.

26. What is a trend in retail distribution?
- A. Brick and mortar retailers are increasing in their share;
 - B. Direct-to-consumer retailing by producers has been a major factor;
 - C. A shift from single product offerings to bundled services;
 - D. In music, digital download revenue is growing faster than digital streaming revenue.
27. 1. What are criteria for selecting distribution intermediaries?
- A. Track record.
 - B. Financial position.
 - C. Commitment of distributor to other and possibly competing products.
 - D. All of the above.
 - E. A and C only.
28. What action by a media producer is most likely to backfire in a producer distributor setting?
- A. Development of new products;
 - B. Creation of new distribution channels;
 - C. Setup of an innovative marketing team;
 - D. None of the above.
29. Which of the following statements about revenue shares in the media distribution chain is correct?
- A. Creators typically receive the largest revenue share;
 - B. On average across all media, producers generate the highest revenues;
 - C. Distributors receive a higher revenue share for online content media than for physical content media;
 - D. Relative to distributors, retailers receive a higher revenue share for pay cable films but a lower revenue share for broadcast television.

Appendix: Revenue Shares

(Tables 12.8 and 12.9)¹⁹²

| Table 12.8 Revenue shares | |
|---|---|
| Film-theater distribution ^a | Percentage of total revenue |
| <i>Exhibitor (retail)</i> | 40% |
| <i>Distributor</i> | 45% |
| Marketing | 20% |
| Admin/overhead | 10% |
| Profit | 15% |
| <i>Producer</i> | 16% |
| Production, shooting, etc. | 16% |
| <i>Creators/artists</i> | 11% |
| Script rights | 2% |
| Director | 2% |
| Cast/artists | 7% |
| <i>Net profit</i> | (12)% |
| Film-pay-cable distribution ^b | Percentage of total revenue |
| <i>Cable MSO (retailer)</i> | 33.5% |
| <i>Wholesale distributor</i> | 38.5% |
| Cable pay channels (HBO) | 20.5% |
| Studio distributors | 18% |
| Admin/overhead | 20% |
| Profit | 15% |
| <i>Production</i> | 20% |
| <i>Creators/artists</i> | 8% |
| Film-broadcast TV distribution ^c | Percentage of total revenue (incl. advertising) |
| <i>Local TV Station (Retail)</i> | 22% |
| <i>Wholesale distributors</i> | 46% |
| TV network | 27.5% |
| Marketing | 10% |
| Admin/overhead | 7.5% |
| Profit | 10% |
| Film distributors | 18.5% |
| Marketing | 4% |
| Admin/overhead | 5% |
| Profit | 9.5% |

| Table 12.8 (Continued) | |
|--|---|
| <i>Producer</i> | 22% |
| <i>Creators/artists</i> | 10% |
| Film: online distribution (Netflix) | Percentage of total revenue (incl. advertising) |
| <i>Online content site (retailer)</i> | 25.8% |
| Technology, CDN, development | 9% |
| Marketing | 10% |
| General administration/overhead | 4.3% |
| Content site profit | 2.5% |
| <i>Distribution ISPs</i> | 4.7% |
| <i>Content wholesale distributor</i> | 20% |
| <i>Advertising intermediaries</i> | 24% |
| <i>Production</i> | 20% |
| <i>Creators/artists</i> | 5.5% |
| Film: home video store chain distribution ^d | Percentage of total revenue |
| <i>Retailer</i> | 25% |
| <i>Distributors</i> | 50% |
| Marketing | 20% |
| Admin/overhead | 10% |
| Profit | 20% |
| <i>Producer</i> | 17% |
| <i>Creators/artists</i> | 8% |
| Hardcover book ^e | Percentage of total revenue |
| <i>Bookstore (Retailer)</i> | 40% |
| <i>Wholesale Distributor</i> | 12.5% |
| <i>Producer/publisher:</i> | 35% |
| Printing, storage, shipping: | 12.5% |
| Design, typesetting, editing: | 3% |
| Marketing | 3.9% |
| Admin/overhead: | 7.8% |
| Profit | 7.8% |
| <i>Creators/authors</i> | 12.5% |

(continued)

¹⁹² Revenue shares are net of payments to the upstream stages that are listed. Profits listed are those of the central stage, usually the distributors. For the other stages there are outlays to other suppliers such as landlords and raw materials, etc. Calculations are based on the sources listed, plus experts' feedback, and estimated, in order to create a cross-industry consistency of presentation.

Table 12.8 (Continued)

| Ebooks ^e | |
|---|-----|
| Retailer | 30% |
| Producer/publisher: | 53% |
| Digitizing, tech, typesetting, editing: | 8% |
| Marketing: | 6% |
| Admin/overhead | 13% |
| Profit | 26% |
| Creators/authors: | 17% |
| Music CD ^f | |
| Percentage of total revenue | |
| Retailer | 20% |
| Distribution (wholesale) | 17% |
| Physical distribution | 10% |
| Admin copyrights | 7% |
| Label (production) | 46% |
| Manufacturing | 10% |
| Production (recording) | 5% |
| Marketing | 15% |
| Overhead | 10% |
| Profit | 6% |
| Creators/artists (incl. composer) | 17% |
| Performer & composer | 11% |
| Composer & songwriter | 6% |
| Online music ^g | |
| Percentage of total revenue (incl. advertising) | |
| Retailer | 30% |
| Distributor (encoding/ submission) | 8% |
| Producer (label) | 28% |
| Marketing | 11% |
| Production (recording) | 10% |
| Admin/ Overhead | 5% |
| Profit | 2% |
| Advertising intermediaries | 18% |
| Creators/artists | 16% |
| Performers | 10% |
| Songwriter & composer | 6% |

Table 12.8 (Continued)

| Magazines (print) ^h | | |
|---|-----------------------------------|--|
| | Percentage of circulation revenue | Percentage of total revenue (incl. advertising) |
| Retail | 30% | 15.0% |
| Wholesale | 15% | 7.5% |
| Producer/publisher | 55% | 67.5% |
| Production | | 25.6% |
| Marketing | | 11.6% |
| Admin/overhead | | 7.8% |
| Profit | | 12.5% |
| Creators/editorial | | 7.5% |
| ⁱ Including advertising revenue assuming 100% of circulation revenue | | |
| Online magazines ^j | | |
| | Percentage of circulation revenue | Percentage of total revenue (incl. advertising) |
| Retail (online news-stand) | 30% | 12% |
| Producer/publisher | 70% | 67% |
| Marketing & PR | | 20% |
| IT & development | | 27% |
| Admin/overhead | | 20% |
| Advertising intermediaries | | 7% |
| Creators/editorial | | 20% |
| Net loss | | 0% |
| ⁱ Advertising revenue estimate 150% of circulation revenue | | |
| Newspapers-print ^k | | |
| | Percentage of circulation revenue | Percentage of total revenue ^l (incl. advertising) |
| Retail (vendors) | 30% | 10% |
| Wholesaler | 20% | 6.6% |
| Producer/publisher | 50% | 59% |
| Materials | | 16.7% |
| Production | | 20.8% |
| Admin/overhead | | 8.3% |
| Advertising & marketing | | 12.5% |
| Profit | | 12.5% |
| Creators/editorial | | 12.5% |
| ⁱ Including estimated advertising revenue at 200% of circulation revenue | | |

Table 12.8 (Continued)

| Newspaper online ^l (free) | Percentage of total advertising revenue | |
|--|---|---|
| Retail (online news-stand) | 3% | |
| Producer/publisher | 44% | |
| Marketing | 15% | |
| IT & tech | 35% | |
| Admin/overhead | 15% | |
| Profit | 2% | |
| Advertising intermediaries ^m | 23% | |
| Creators/editorial | 30% | |
| Newspapers online subscription ⁿ | Percentage of subscription revenue | Percentage of total revenue (incl. advertising) |
| Retail (online news-stand) | 30% | 15% |
| Producer/publisher | 50% | 45% |
| Marketing | | 15% |
| IT & tech | | 20% |
| Admin/overhead | | 15% |
| Profit | | 15% |
| Advertising intermediaries | | 20% |
| Creators/editorial | | 20% |
| ^l Including estimated advertising revenue at 100% of subscription revenue | | |
| Consumer electronics ^o | Percentage of total revenue | |
| Retail | 25% | |
| Distributor | 20% | |
| Producer/manufacturer | 45% | |
| Production cost | 20% | |
| Marketing | 10% | |
| Admin/overhead | 10% | |
| Profit | 5% | |
| Creators/engineers | 10% | |

^aHollywood movie. Source: ► http://www.eastlakedrama.com/Film_files/Film%20-%20Cost%20Hollywood%20Movie.pdf; ► http://www.eastlakedrama.com/Film_files/Film%20-%20Cost%20Hollywood%20Movie.pdf; ► http://www.creativeskillset.org/film/knowledge/article_5103_1.asp.

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Moldvay, Caitlin. "IBISWorld Industry Report 32311 Printing in the US." *Morris Anderson*. August 2012. Last accessed July 5, 2017. ► http://www.morrisanderson.com/images/uploads/documents/32311_Printing_in_the_US_industry_report.pdf.

^mAdvertising servers such as Google provide media firms with a share of ad revenues of about 32%. Another part of ads are generated by the media firms themselves, and are not subject to sharing with the ad servers. The extent of self-generation varies for different media, and is estimated as 75% for magazines, 25% for newspapers and film/video, and 10% for music.

ⁿLeurdijk, Andra, Mijke Slot, and Ottilie Nieuwenhuis. "Media Content Industry: Newspaper publishing case study." *TNO*. May 31, 2011. Last accessed July 5, 2017. ► <http://is.jrc.ec.europa.eu/pages/ISG/documents/TNOpoptIPTnewsdef31May2011.pdf>;

Moldvay, Caitlin. "IBISWorld Industry Report 32311 Printing in the US." *Morris Anderson*. August 2012. Last accessed July 5, 2017. ► http://www.morrisanderson.com/images/uploads/documents/32311_Printing_in_the_US_industry_report.pdf.

^oKeohi. "Dealer Costs." Last accessed July 5, 2017. ► <http://www.keohi.com/keohihdtv/learnabout/generaltips/miscellaneous/dealercosts.html>.

Table 12.9 Revenue shares by media segment (all types of distribution of content medium)

| | Creator | Producer (incl. advertising intermediaries) (%) | Wholesaler/distributor (%) | Retailer (%) | Key segment profit ^a (%) | Share of distribution (wholesale & retail) in revenues (%) | Wholesale share of in overall distribution (%) |
|--------------------------|---------|---|----------------------------|--------------|-------------------------------------|--|--|
| Film | 8.4 | 23.8 | 40.8 | 29.3 | 14.4 | 70.1 | 58.3 |
| Books | 14.8 | 44 | 6.3 | 35 | 16.9 | 41.3 | 15.2 |
| Music | 16.5 | 46 | 12.5 | 25 | 4 | 37.5 | 33.3 |
| Magazines | 13.8 | 70.8 | 3.8 | 13.5 | 6.3 | 17.3 | 21.7 |
| Newspapers | 20.8 | 63.7 | 2.2 | 9.3 | 9.8 | 11.5 | 19.1 |
| Consumer electronics | 10 | 45 | 20 | 25 | 5 | 45 | 44.4 |
| Physical content media | 11.4 | 40.1 | 23.1 | 25 | 12.3 | 48.1 | 48.0 |
| Electronic content media | 15.8 | 48.9 | 14.7 | 21.4 | 10.3 | 36.1 | 40.6 |
| Online media | 18 | Producers 42.8 Advertising intermediaries 15.3 | 5.5 | 19.3 | 7.9 | 24.8 | 22.0 |
| All media | 13.9 | 38.5 | 18.3 | 23.0 | 11.1 | 41.2 | 44.3 |

^a"Key Segment" are the producers for all media, except for the several film media types, where the distributors are the central player

Quiz Answers

- ✓ 1. D
- ✓ 2. B
- ✓ 3. B
- ✓ 4. D
- ✓ 5. C
- ✓ 6. A
- ✓ 7. D
- ✓ 8. C
- ✓ 9. D
- ✓ 10. C
- ✓ 11. D
- ✓ 12. D
- ✓ 13. A
- ✓ 14. A
- ✓ 15. A
- ✓ 16. D
- ✓ 17. B
- ✓ 18. B
- ✓ 19. C
- ✓ 20. B
- ✓ 21. C
- ✓ 22. D
- ✓ 23. A
- ✓ 24. D
- ✓ 25. C
- ✓ 26. C
- ✓ 27. D
- ✓ 28. B
- ✓ 29. B