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Gutenberg to Zuckerberg: Innovation and Entrepreneurship

It is 1450 in the medieval town of Mainz in Central Europe. A former blacksmith and engraver is seeking investors for a secret project he refers to simply as “the work of books.” Until now, Johannes Gutenberg, the youngest son of aristocrats, has led a rather peripatetic life shuttling among cities along the Rhine River as he seeks to make his own fortune. With money he inherited from his mother’s estate, he’s invested in a number of commercial ventures, including a plan to manufacture and sell handheld mirrors that are supposed to reflect a “holy light” on pilgrims visiting a 1439 exhibition of Emperor Charlemagne’s relics in Aachen. Unfortunately, floods delay the pilgrimage for more than a year. As with many of his ventures, the profit he envisioned never materializes. With his inheritance gone, he has returned to the city where he was born and sets up a workshop in a building owned by a distant cousin.

Far from being discouraged, Gutenberg, who is now in his early fifties, is once again dreaming of striking it rich. Over the past decade, he has acquired a grab bag of skills, including metallurgy, and has invented several new manufacturing processes that he hopes to use in this new venture of printing and selling Bibles. But first, he needs an investor to advance him the funds. A local banker by the name of Johann Fust steps forward, lending Gutenberg 1,600 guilders (which is several hundred thousand euros in today’s currency). Fust also introduces him to Peter Schoeffer, who signs on as an apprentice. Using the calligraphy skills he has developed working as a scribe in Paris, Schoeffer begins designing the typeface for the Bible while Gutenberg, the alchemist, attempts to bring all of his inventions together in a sequential printing process.

History recognizes Gutenberg as the inventor of the printing press. In fact, in his workshop, he invents, not one, but four separate products and processes. First, he develops a hand mold that he uses to cast individual letters of the alphabet. Once his moveable letters are cast in metal, they are fitted into a frame, and used to make multiple impressions of the same word onto a page. He then turns his attention to ink and paper, experimenting with formulas, adjusting the viscosity of the ink so that it bonds firmly with the paper, which also must be just the right thickness so it will not be shredded by the metal type. As a final step, he invents a new type of press—one with a screw that can be manually tightened using a wooden handle that compresses the type onto a flatbed surface onto which the image will be imprinted.

It takes several years of experimentation and adjustment to get the printing process just right. All the while, Gutenberg employs more than 20 people in his workshop because producing a quality reproduction of the Bible is a huge undertaking. Setting the 42 lines of type on each of the 1,282 pages requires at least a half day. Gutenberg attempts to cover his day-to-day payroll and operating expenses by printing a variety of other less

prestigious materials, including indulgences, pamphlets, poems, and a Latin grammar book. By 1455, Gutenberg is finally ready to go to market, having produced almost 180 copies of his masterpiece. He tentatively decides to charge the princely sum of 40 guilders for each Bible.

Unfortunately, his investor has grown impatient. Fust sues Gutenberg for 2,000 guilders, claiming that over the past three years he has made no interest payments on the original loan of 1,600.

Gutenberg's apprentice, Schoeffer, testifies for Fust, who prevails in court. In addition to receiving a financial settlement from Gutenberg, Fust is awarded possession of almost all of the Bibles that have been printed, as well as the equipment in the workshop. With proceeds from the sale of the Bibles and using the tools and processes that Gutenberg had invented, Fust and Schoeffer set up their own workshop. In 1457, they become the first printers in Europe to publish a book stamped with their own branded imprint. On his own after Fust's death a decade later, Schoeffer becomes one of Europe's most successful and famous early printers, publishing his own version of the Bible, as well as catalogues and dictionaries that are sold through a far-flung network that stretches across the western half of the continent.

In contrast, Gutenberg's finances are apparently in tatters. In the years after the lawsuit, Gutenberg continues doing some minor print work, maybe even furnishing type for another Bible produced in 1459. He dies around the age of 70 in 1468, unknown outside his small circle of friends and former associates, the significance of his innovations largely unrecognized. He is buried in a churchyard cemetery near Mainz that has since been destroyed, his gravesite lost to posterity.

Gutenberg was the original "disruptive innovator." His inventions and improvements wrenched civilization from the age of the scribe whose works were available only to an elite few into a secular age of mass-produced, widely circulated texts that spawned social, political, and economic revolutions. Today, there are statues of Gutenberg throughout Europe, a university named after him, and a museum dedicated to him and his inventions in his hometown, right across from the imposing, 1,000-year-old Mainz Cathedral, under the spires where he set up his now famous workshop. In 2000, at the dawn of the third millennium, both scholars and journalists for the popular press that his inventions fostered proclaimed Gutenberg as one of the most important figures in the history of mankind.

Yet it was not until 50 years after his death that Gutenberg was finally acknowledged in historical texts as the inventor of typography and modern printing processes. From the vantage point of the twenty-first century, it is instructive to contemplate the supreme ironies of Gutenberg's life and the lessons it holds for today's digital innovators and entrepreneurs. Why were his innovations in printing processes and products—which revolutionized communication—unrecognized during his lifetime? Why did the world's first media innovator fail to capitalize financially on his own transformative inventions and become a successful media entrepreneur?

In this chapter, we will explore the difference between successful innovators and successful entrepreneurs. Among the questions we'll consider are:

- What is a media enterprise and what are the core competencies of economically successful media companies?
- What are the key transformative media innovations? How have business models for media enterprises changed over time in response to those innovations?
- What is the difference between a disruptive innovation and a sustaining innovation?
- What are the key mistakes that Gutenberg made? What are the lessons for today's media entrepreneurs?

Defining a Media Enterprise

Prior to Gutenberg, publishing was a solitary artistic endeavor. A wealthy benefactor would commission a scribe, skilled in the art of calligraphy, to hand-copy a text onto either parchment or paper. Most of the transcription occurred in the monasteries and most of the texts were of an exclusively religious nature. Transcribing a single book typically took at least a year, sometimes as much as two years, depending on the length of the text. Because the scribes were creating a new text by copying from an existing one (which most likely was itself a copy of the original document), they often codified errors that had been made by previous scribes in the new version, or they unintentionally edited in their own errors. Additionally, the quality of the actual reproduction depended on the calligraphy skills of the craftsman doing the transcription. Therefore, most accomplished scribes were considered “artists,” and they tended to have only a handful of very wealthy clients who paid for their services.

After Gutenberg, publishing was a commercial endeavor. In contrast to the artist-scribe, a successful publisher needed to understand not only the economics underpinning every phase of producing a book, but also those involved in selling and distributing his products to many customers. Successful publishers began mastering the art and science of marketing, as well as manufacturing. They quickly developed a rudimentary understanding of such modern-day terms as “target market,” “pricing sensitivity,” and “competitive threat,” while simultaneously moving toward a more efficient division of labor on the manufacturing side.

Economics is the study of how individuals and firms make choices, given that we have limited resources, such as time and money, available to us. Economists define a firm, or company, as an enterprise that converts raw materials into products or services, which are then distributed to consumers. Media firms straddle the line between traditional manufacturers of physical products, such as autos, and service providers, such as banks and financial institutions, since they create and distribute *both* products and services. An idea might well remain ephemeral—a momentary thought passing through in our own minds or a joke shared between two people and then forgotten—unless it is transformed (packaged) into a product that is distributed to others.

Media companies provide a service by creating or acquiring content that serves the needs and wants of society—such as information or entertainment. That content may then be packaged with other content to form a product, such as a newspaper, television show, or website. *Therefore, we can define a media enterprise—distinct from other firms—as one that is involved in acquiring or creating content, which is then packaged and distributed to various individuals and groups in society that will consume that content.* In business lingo, we can say that the creation, packaging, and distribution of content are the “*core competencies*” of a media firm.

The type of content produced by media enterprises determines the potential audience, and that, in turn, determines the business model of a specific media industry. Today’s media companies produce a wide variety of content that has traditionally been grouped into four broad categories:

- *News*, such as the content in the *New York Times* and on the *NBC Nightly News* broadcast.
- *Information*, including business-to-business providers of proprietary research and analytics, such as Reed Elsevier’s Lexis-Nexus for lawyers and Bloomberg’s Business Wire for Wall Street traders.
- *Persuasion*, such as Ogilvy and Mather and other advertising and marketing agencies, or the commentary news shows on cable networks such as Fox.
- *Entertainment*, such as Viacom, with its cable channels and Paramount film studios.

Some media companies, such as the New York Times Company, specialize, providing primarily general interest news and information. Others, such as the Walt Disney Company, produce a variety of content that spans the spectrum from news to entertainment to retail. Therefore, Disney has a different business model than the New York Times Company. It also has a distinct model for each of its business divisions, which range from theme parks to movies. More and more, in the digital environment there has been a blurring of the lines between the four distinct categories, as media companies seek to engage audiences who want to interact with the content, both online and in-person, and in a variety of forms, including quizzes and video games as well as theme park rides. In the process, consumers have also become creators of content.

However, many of the underlying economics of today's media enterprises were established during the Gutenberg era when he began to separate the processes involved in publishing a book. Let's briefly consider the economics of each of the three processes—creating, packaging, and distributing content—for two types of publishers, a newspaper and a book publisher. First, a media enterprise needs to either create content or acquire it. A newspaper will hire a journalist to do original research and reporting that are then transformed into an article. Once the article is written, an editor will then package that content together with other articles written by other reporters. The package becomes an “edition” that is distributed to consumers—either physically (by carriers) or via the Internet. Book publishers, on the other hand, tend to acquire content, contracting with a specific author to produce a manuscript, or paying someone for the right to reproduce material that already exists. Once a manuscript is submitted, an editor packages the content into a finished book, which is then distributed through retail outlets—either book stores or online.

Both newspapers and book publishers incur significant costs as they create, package, and distribute content. Historically, consumers have been more willing to pay for certain types of information and entertainment than for general interest news. Book publishers cover their costs of producing content by selling directly to consumers. In contrast, newspapers, which traffic in general interest news, typically sell access to the audience the content attracts. They charge readers only a fraction of the costs associated with producing and distributing the content, and instead rely on revenue from their advertisers to cover the majority of the expenses and also provide them with a profit.

Even though they have two revenue models, both types of publishers need to have a thorough understanding of their audience: How large is the target audience? What is the best method for distributing content to that audience? How much are the consumers of the content willing to pay in order to receive it? Or, conversely, how much will someone else pay to have access to that audience?

This means that successful managers of today's media enterprises—whether commercial ventures or non-profit entities, such as the Public Broadcasting Corporation—must develop an economic mastery of the processes and procedures necessary to produce and distribute a firm's unique content. They must also possess a strategic understanding of how the various processes can be enhanced or disrupted by innovation.

How Innovation Drives the Business Models of Media Companies

Disruptive technological innovation has given rise to three distinct eras in communication: print, electronic, and digital. Over the past 550 years, each technological breakthrough has built on previous innovations and expanded the influence of the media

industry and its reach. Each met an existing market demand or created a new one. Each technological breakthrough spawned new business models.

The Print Era (1450–1900)

This era is divided into two periods: pre- and post-1800. Figure 1.1 summarizes some of the main innovations in the print era. The early years of the print era coincided with the Renaissance movement of the fifteenth century, which had started in the city of Florence and created an interest among the educated classes in reading Greek and Roman classics. By 1450, there were a number of innovators across Europe attempting to solve the riddle of printing books on a press in order to meet a new market demand for secular texts that could be produced much more quickly and inexpensively than the manuscripts produced by scribes.

We don't even know how the first printing press looked since all we have as guides are artists' renderings of wooden presses built in the late 1400s. By 1600, hand-operated wooden presses, very similar to the one we suppose Gutenberg had built 150 years earlier, were ubiquitous throughout the towns in Europe. An estimated 200 million books of varying quality were in circulation. The most expensive included engraved illustrations and maps, using a technique perfected and introduced around 1550. Simultaneously, pamphlets were evolving into newspapers. The first printed newspaper was published in 1605 in Strasbourg and the first English language newspaper in 1622 in London, followed by the first daily in 1702. However, despite incremental refinements in the printing process, books and newspapers published prior to 1800 looked very similar to those published in 1700. Publishing was not a mass medium and was often a side business.

Innovations of the early nineteenth century—starting with the introduction of the steam-powered rotary press—vastly improved the quality and speed of producing printed material and heralded the arrival of the era of mass communication, as well as the establishment of modern-day media business models.

The Steam-Powered Rotary Press

After the introduction and swift adoption of the steam-powered press with rotary cylinders in the early 1800s, the business models of book publishers and newspaper publishers diverged, and a new media industry—advertising—was born. Prior to the early 1800s, newspaper publishers were limited in the number of copies they could sell by the capacity

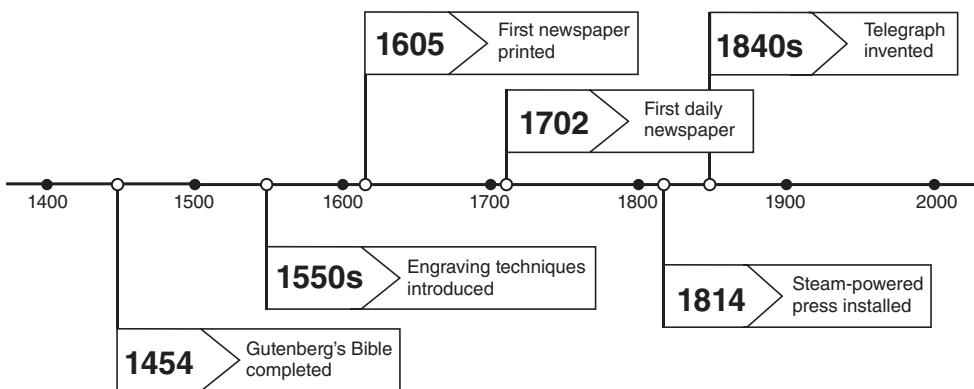


Figure 1.1 Timeline of some major innovations in the print era (1450–1900).

of hand-operated presses, which could only print about 3,600 page impressions a day. Circulation of a typical paper ranged from a few hundred copies to a couple of thousand and was confined to a small geographic area near the printer's shop.

The invention of the steam-powered press, which could print several thousand copies an hour, coincided with the Industrial Revolution and the mass migration of people throughout Europe and North America to cities. Businesses wanted to entice new urban residents to their establishments, and daily newspapers suddenly had the ability to distribute thousands of copies. The Penny Press era was born. Newspapers dropped the price they charged readers from 6 cents to 1 cent and made up the difference by charging businesses to advertise their goods and services. The lower price attracted more readers, which allowed newspapers to increase the price they charged advertisers. This established a new business model for both newspapers and the mass-circulation magazines that came on the scene shortly afterwards. In contrast to the book publishing industry, mass circulation newspapers and magazines increasingly relied on advertisers—not readers—to provide the majority of their revenue. Previously, newspaper publishing was a marginally profitable business, if that. After the introduction of paid advertising, it became a much more profitable enterprise, leading to the rise of the first media barons.

The Division of Labor and Economies of Scale

As publishing evolved into a modern-day business enterprise, a division of labor began to emerge. The steam-operated printing presses required skills very different from those in the past and led to a *division of labor*. Previously, one or two people—perhaps the printer and his apprentice—could write, compose, and then print a four-page weekly paper. The publisher of a multi-page daily paper, printed and distributed daily to thousands of people, could no longer be a master of all trades. He needed more people with specialized skills. He needed people to write and edit stories, set type (perhaps on the linotype machines that were invented in the 1850s), operate the expensive press, and then deliver and sell thousands of printed copies. By 1845, the *New York Herald* had a staff of 12 in the news room and 20 in the composing and press room. Large US and European daily newspapers in the 1850s and 1860s employed as many as one hundred people, and by the end of the century, famous writers and journalists, such as Horace Greeley and Nellie Bly, had become household names. The process of creating and packaging content had evolved into a profession—that of the writer and editor—while that of printing and distributing had become a craft.

The steam-powered presses were much more efficient than the hand-operated type, but they were also much more expensive. However, the more copies that were printed and circulated, the more advertising a newspaper could attract. Therefore, there was a tremendous incentive to grow circulation, and this, in turn, brought down the *marginal cost* of each paper that was produced on the new press. This is called *economies of scale* since fixed costs (the cost of purchasing and operating the press) are spread over more and more copies that are printed and distributed.

New Products (Telegraph, Photography, and the Typewriter)

Three other innovations improved the quality of the content that was being created, packaged, and sold to readers. The invention of the telegraph in the 1840s gave writers an ability to relay news and other information in a timely fashion, and led to the establishment of the first news co-operative, the Associated Press, in which a group of newspapers shared stories and information among themselves, defraying the costs for an individual

enterprise. This is also an example of the *network effect*: the more papers that joined the Associated Press, the more stories that were shared, which benefited all the member newspapers in the cooperative.

Beginning in the 1870s, the adoption of the typewriter as the preferred method of writing stories greatly speeded up the process of both creating written prose and transcribing dictated content. The QWERTY typewriter keyboard, named for the first six letters on the top row, was invented and patented by a newspaper publisher, and was designed to prevent the keys on typewriters from jamming. This keyboard is an example of how a standard once accepted endures, even though more efficient alternatives are invented. Economists call this *path dependence*. Once enough industries have adopted a standard, and enough consumers are proficient with a certain way of doing things, we stay the course unless an alternative of vastly superior quality induces us to switch. So, the hundred-year-old QWERTY keyboard was incorporated into the first personal computers and remains a standard in the digital age.

The use of photography in publications began the transition from the print era of unbroken columns of type to the electronic era of images and moving pictures. It also created yet another journalism profession, that of the photojournalist. Engraved illustrations were the only artwork printed in books, newspapers and magazines prior to the 1850s. By the 1860s, rudimentary hand-engraving processes—some involving wood, others involving copper—allowed for the reproductions of art prints and the Civil War photos Matthew Brady in fine books and magazines (such as *Harper's Weekly*). The first halftone image (in which a photo is converted into dots of varying size) was published in a newspaper in 1873, and by the 1880s, photography was in widespread use in papers and magazines, bringing a you-are-there realism that was previously missing.

You did not have to be literate to appreciate a photograph. But perhaps more importantly, refinement and improvements in both cameras and film throughout the nineteenth century led directly to the introduction of moving pictures, which are really a series of still photos that appear to be moving when shown in rapid sequence on a screen. While reading was oftentimes a solitary endeavor, the consumption of motion pictures—and later radio and television shows—could be a communal one, enjoyed by many people simultaneously.

By the end of the nineteenth century, there were two established and distinct business models for media enterprises. Book publishers, and later motion picture producers, sold their content directly to consumers, while newspapers and magazines relied on advertisers to provide the majority of their revenue. A number of economic concepts that underpin today's digital enterprises had also begun to emerge, including economies of scale, the network effect, and path dependence.

The Electronic Era (1900–1990)

The technological innovations of the print era—especially the telegraph, telephone, and photography—laid the groundwork for the electronic era, which is divided into two periods, marked by the rise of radio and then television. Figure 1.2 summarizes the major innovations of the electronic era. The first AM radio stations of the early twentieth century ushered in a new era in mass communication, as they transmitted audio signals through the air as radio waves, which were received by thousands of antennas and then routed to thousands of individual radio sets. This new era coincided with a number of technological breakthroughs, such as the installation of electricity in most homes in the United States and Europe, leading to a quick adoption of this new medium. This

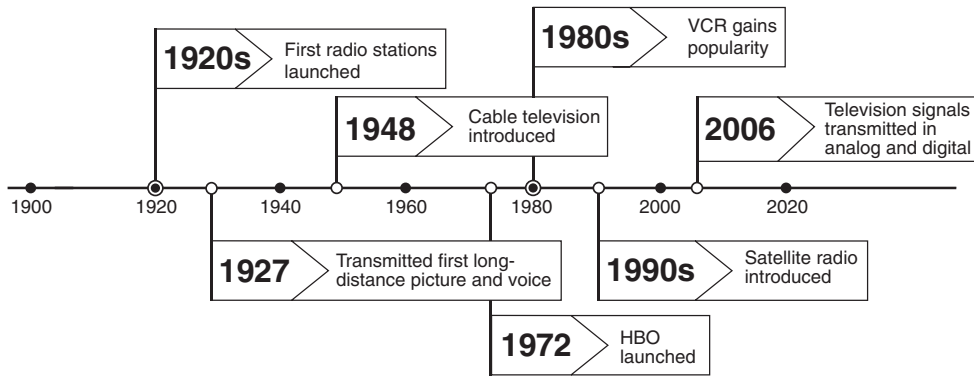


Figure 1.2 Timeline of some major innovations in the electronic era (1920–2006).

expansion of media enterprises into the broadcasting arena also led to the creation of totally new media enterprises which were regulated by the government and the creation of a variety of new business models.

The Broadcast Model

First with radio, and then with television, which was developed in the 1930s and 1940s, a networked system evolved. This system tied together multiple stations, which were required to have a government license to broadcast their signal across a region. In the UK, the British Broadcasting Company (BBC), founded in the 1920s and funded primarily by a fee charged to all households in the country, became the first non-profit, government-supported broadcasting organization. This model was adopted and is still prevalent in many countries today. In the United States, where a listener or viewer of a broadcast program could receive the over-the-air signal of a broadcasting network without paying any fee for the privilege, a for-profit model prevails. Even from its earliest day, the potential audience for radio and television shows was many times larger than that of the largest newspapers of the day. Therefore, early for-profit radio networks in the United States (such as CBS and NBC), and the for-profit television networks that succeeded them, relied solely on the revenue they received from advertisers who wanted to reach a large audience in a certain region.

The Cable Model

The wired cable companies that arose in the United States in the 1950s and the 1960s developed yet a different business model, charging a monthly fee to customers who signed up for their services. They justified this charge because their large antennas could receive broadcast signals from multiple stations across a wide geographic area—signals that were often too weak to be received by the smaller rooftop antennas perched on houses. Initially, most households that subscribed to a cable service could only receive two or three network channels. That began to change in the 1970s, when Time-Life launched Home Box Office (HBO), the first subscription-based television channel. The HBO signal was delivered via satellite transmission to cable operators throughout the country, who then retransmitted the programming to customers who paid an additional monthly surcharge. Simultaneously, Ted Turner, the owner of an outdoor advertising company in Atlanta, purchased a small, struggling, local ultra-high frequency (UHF) station, and also began delivering that station's signal to remote cable operators via satellite.

Other Business Models

Primetime television viewing peaked in the 1980s, a decade that witnessed the introduction of video cassette recorders (VCRs), video games (Pong), and the first cellular telephones, as well as the rollout of several new cable-only channels, including CNN, the first all-news station. These new channels, which were aimed at smaller, niche audiences, established another business model, relying on revenue from both advertisers, as well as from the cable operators, which paid a fee to the station owners to carry their programming. VCRs and video gaming introduced yet another business model, in which consumers paid twice—for the machine and then for the individual games or tapes.

The 1990s saw a continued ramping up of ancillary products and services, including the introduction of satellite radio (SiriusXM) and television (DISH and DIRECTV) providers, the swift adoption of the DVD player (and demise of the VCR) and the launch of TiVo (interactive TV services).

By the end of the century, two dominant economic models had emerged around the two largest electronic media segments—the networks and the cable providers. The original broadcast networks continued to rely overwhelmingly on revenue from advertisers who wanted to reach a mass audience. This made their business model vulnerable as new cable channels, and later the Internet, siphoned off customers. In contrast, the cable operators relied on revenue from consumers, and this put them on a collision course in the twenty-first century with digital services, such as Netflix and Amazon that also charge consumers a monthly fee for the privilege of streaming or downloading content. The number of cable subscribers in the United States peaked in 2012, while the number of consumers streaming content continues to grow.

The Digital Era (1990 to present)

The adoption and rapid spread of digital technology are often referred to as the Third Industrial Revolution—the first occurring in the early 1800s with the invention of steam-powered engines, and the second occurring at the turn of the twentieth century as mechanized manufacturing took hold. Like the electronic and print eras, the digital revolution in media occurred in stages, only this time it occurred over a much shorter timeframe. There are three main inflexion points that greatly influenced the speed with which this new technology was adopted. Figure 1.3 summarizes the major innovations in the digital era.

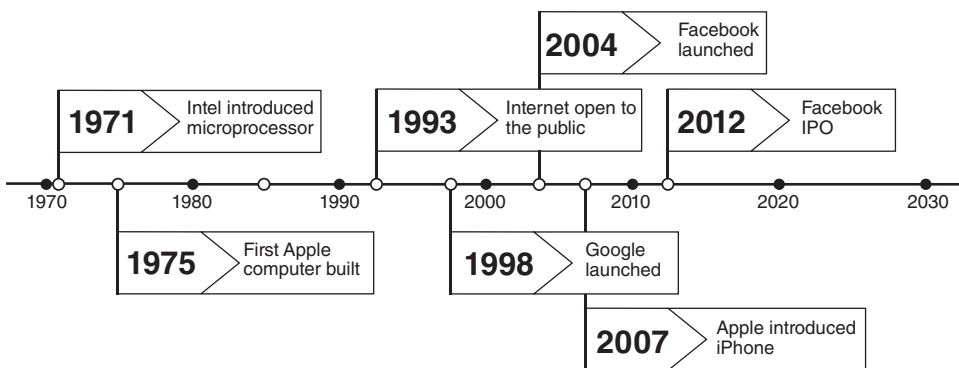


Figure 1.3 Timeline of some major innovations in the digital era (1970–2012).

The Chip

The first point occurred in the mid-1970s with the development of the microprocessor—or rather the chip that sits in our personal computers, smartphones and tablets, and serves as the brains of these mini-computers. The microprocessor was born out of an idea articulated by Gordon Moore in the mid-1960s. Moore observed that historically, the number of transistors on a circuit board had doubled every two years or so, due to advances in computer technology. He hypothesized that this growth could continue exponentially for some time into the future. Known as Moore's Law, this insight led him to found a company called Intel shortly afterwards. At the time, all computers at individual workstations were “dumb” terminals tethered to a large mainframe.

In 1971, Intel introduced its first microprocessor designed for use in a calculator the size of an index card. Throughout the 1970s, more and more applications were added. By the 1980s, the majority of computers being manufactured had the Intel chip. Even as the cost of manufacturing computing chips dropped dramatically, the capacity of the chips continued to increase exponentially. This led to rapid adoption of personal computers in the workplace throughout the 1980s. During the 1990s, the PC took up residence in our homes. By 2000, half of households in the United States had a PC; by 2010, 70 percent of homes had a personal computer.

Web 1.0

A second inflexion point occurred in the 1990s when the Internet was opened to commercial use, and communication suddenly became interactive, real-time, and global, at least for those who had access to a computer at either work or home. In only 20 years, the World Wide Web evolved from a network of computers called ARPANET (Advanced Research Projects Agency Network) set up in 1969 so mainframes at several West Coast universities could “talk” to one another, into a system of protocols and linkages to hyper-text documents that could be accessed through client servers from anywhere around the world.

In 1993, it became official, with an announcement from CERN, the Swiss institute where computer scientist Tim Berners-Lee worked while implementing his design for the World Wide Web: the Internet could now be used by developers, as well as the public, for free. This effectively meant the Internet was open for business, as easy-to-use browsers and commercial Internet service providers rapidly became available. Suddenly personal computers could be used for a lot more than office tasks. You could email friends and family, purchase items online and search for documents and information stored in remote sites. Portals (such as AOL), commerce sites (including eBay and Amazon), and search engines (such as Magellan, Lycos, and Yahoo!) enticed more and more consumers onto the Web.

Most legacy media companies initially underestimated what a disruptive innovation this was. They tended to view the Internet as yet another system for distributing the content that they were already producing to consumers. They failed to realize that the interactivity of the Web made it a much more effective medium for certain types of advertising, and a more engaging one for consumers. Instead of passively receiving news and information, consumers could join in the conversation and share content they found interesting instantaneously with friends and family, or they could search for an item and buy it without ever leaving home. Despite the dot-com bust of the late 1990s, within a decade of its public unveiling, the Internet was delivering a one-two punch to the time-tested business models that had sustained print and broadcast, as well as news and entertainment enterprises. The newspaper industry watched helplessly as its most profitable business segment—help-wanted and real estate classified

advertising—moved quickly to online sites, such as Monster and Zillow. As sales of books migrated online, Amazon became the thousand-pound e-commerce “gorilla” that could affect the profitability of book publishers and retailers. The piracy and sharing of copyrighted content online eroded sales of CDs and DVDs throughout the first decade of the twenty-first century.

Web 2.0

The third inflexion point is occurring now, with the rapid adoption of the smartphone and the dawn of the age of mobility. In 2016, more than two-thirds of the population in the United States owned smartphones, compared with less than a third five years before. The percentage was even higher among younger age groups, with more than 85 percent of those under age 30 owning one. The world’s two largest markets are quickly catching up. By 2020, more than two-thirds of the residents in China and almost 60 percent of the population of India are forecast to have mobile phones.

With a smartphone in the back pocket or purse, a consumer today is always on and always texting, emailing, searching, shopping, or connecting with friends. Even though legacy media enterprises can distribute their content via the Web to more people today than ever before, their audience pales in comparison to the digital giants that have emerged in recent years. Google processes more than three billion searches a day, more than a trillion each year, with more than half coming from mobile devices. Facebook has more than two billion users, most logging on through their phones. Alibaba, the large Chinese e-commerce site, already accounts for more than 10 percent of all retail sales in that country, most being done by phone.

Not only do these digital giants reach more people than legacy media, they do it more effectively since their digital platforms allow for direct interaction with consumers and targeted messaging aimed at specific segments of a mass audience. Therefore, advertising revenue has followed consumers, moving rapidly away from traditional media. Newspaper advertising revenue in the United States has fallen below 1950 levels, and continues to decline. Television revenue is projected to decline from 40 percent of total ad spending in 2014 to less than a third by 2020. Digital advertising will rise from 28–45 percent during the same period. In 2016, mobile advertising worldwide topped one hundred billion dollars and accounted for 50 percent of all digital advertising spending. Three-fourths of the eight billion dollars in revenue that Facebook made in 2016 came from mobile advertising.

Increasingly, it is becoming a war on two fronts for legacy media companies, as the digital behemoths evolve and become even larger. In the late 1990s, the leaders of the large media conglomerates—Disney, News Corp, Time Warner, and Viacom—assured themselves that “content (not distribution) is still king,” and that the digital start-ups, which excelled at aggregation or distribution of someone else’s content, would need *their* content. But digital aggregators, such as Google, and distributors, such as Netflix and Amazon, are increasingly evolving into media enterprises that not only package and distribute the content of others, but also *create* their own unique content.

In 2013, for example, Netflix debuted *House of Cards*, a thirteen-episode drama available only to its 62 million global subscribers that cost \$100 million to film and produce. Within three years, Netflix had created another 15 multi-episode dramas, 9 comedies and 13 animated series, plus it had picked up and then produced extra seasons of 7 popular series that had been canceled by cable networks. During the same period, Amazon produced more than 15 series and had more than three dozen in production. Netflix and Amazon are not only competing with one another for viewers, but also with other cable and broadcast networks, and with the legacy cable providers, such as Comcast and Time Warner.

Each of the three eras—print, electronic, and digital—has been more compressed than the previous one, as the time between the first stage (the breakthrough innovation) and the third (commercialization) shrinks. Only a quarter of a century has passed since the Internet was opened for business. But we are witnessing a proliferation of new business models and competitors that far exceeds the previous eras. The line has blurred between legacy media companies that have historically created, packaged, and distributed their own unique content, and the tech giants, such as Google and Amazon, who are now creating their own content, as well as aggregating and distributing the content of others.

What Is the Difference between Disruptive versus Sustaining Innovation?

Our digital era is replete with folkloric tales of innovators who made it big, seemingly overnight. Facebook started in a Harvard dorm room. Google was a Stanford research project begun by two PhD candidates. Apple was born in a garage. We often confuse creativity and inspiration with innovative breakthroughs, and assume that someone wakes up one morning with a brilliant idea and gets to work building the next invention. In reality, however, “most innovation—disruptive or not—begins life as a small-scale experiment,” according to Harvard Business School professor Clay Christensen.

There are typically three stages in the lifecycle of a major innovation. First comes a long period of experimentation and research into new ways of doing things. In this stage, many people may be working on solving the same problem, each from a slightly different angle. Gutenberg may have actually developed a rudimentary printing process and press as early as 1440 in Strasbourg, but he needed another decade of experimentation and adjustment before he could bring all the elements precisely into alignment. Once the breakthrough has occurred, it is followed by an intense, fast-paced period when a number of new products are introduced that build on the breakthrough idea.

The final stage is commercialization. During this period, new entrants fight for market share, often displacing existing businesses and each other. Consider, for example, color television sets. Black and white television sets were invented in the 1930s, followed by color sets a decade later. The first broadcast of a television show in color occurred in the early 1950s. As the quality of color sets improved, more and more people opted to buy them. By 1972, sales of color televisions surpassed those of black-and-white models.

Christensen popularized the term “disruptive innovation” in his book, *The Innovator’s Dilemma*, which was published in the mid-1990s, just as the Internet was taking off. We use that term frequently these days, using it to apply to any type of technological breakthrough that changes an industry’s business models and competitiveness. The mantra for most companies in the digital age has become, “Disrupt or be disrupted.” Not so fast, says Christensen, who has spent the last two decades refining his own research. He now differentiates between two types of technological breakthroughs: disruptive innovations versus sustaining innovations. Both types of innovation have the ability to significantly alter the customer experience and the business model of an industry, but in very different ways. Leaders of media companies need to understand the difference, so they can respond accordingly.

In this book, we will define a *disruptive innovation* as a breakthrough technological invention that creates new products, new industries, new business models, and new markets (i.e. new customers). For example, the invention of the printing press and related processes meant that books and pamphlets now could be quickly reproduced and circulated to thousands of people who had never owned a book before. This, in turn, created

a publishing business with a very different organizational and financial model from that of the cottage-industry scribe era.

In contrast, a *sustaining innovation* makes products better. In the process, these sustaining breakthroughs may also create new business models and new markets. For example, the steam-powered presses developed at the beginning of the nineteenth century were a vast improvement over the hand-operated presses used for the previous three centuries. Books and newspapers could now be produced in greater volume and more efficiently, which brought down the price a customer had to pay. This, in turn, created new markets and new business models for both industries. The Google algorithm is another example of a sustaining innovation that was a major improvement over the labor-intensive search functions initially employed by Altavista, Yahoo!, and Lycos.

It's important to remember that not all innovations—whether disruptive or sustaining—succeed. In fact, most do not. Less than a third of all new businesses are still in existence five years after they are founded. Successful disrupters, according to Christensen, focus on getting the business model right, rather than the quality of the product. As we will discuss in later chapters, disrupters attack existing businesses first on the cost side, producing a new product in a much more efficient way. As they develop distribution channels and gain traction in the market, disrupters siphon off the customers and revenue of the existing business. Only when revenue begins to decline do most existing businesses realize the peril they are facing from the disruptive competitor that has flown under the radar, often for several years.

Existing businesses typically react much faster to the competitive threat posed by a sustaining innovation. Either they will attempt to improve the quality of the product they are offering, or they will acquire or adopt the new entrant and incorporate it into their product mix. Newspaper publishers, for example, grasped immediately the implications of the steam-powered rotary press and began adopting this vastly improved product. An early adoption rate by customers is really critical for a sustaining innovation. Therefore, instead of focusing on undercutting the costs of existing products, successful sustainers quickly develop distribution systems and sales processes that will allow them to amass an early market share. The faster the adoption rate, the more likely the sustainer will develop a successful business model, based on the revenue coming in from new customers.

There is an added advantage. With a quick adoption rate, the improved product may well become the new industry standard, effectively eliminating other competitors. For example, Lycos and Yahoo! very quickly ceded the search market to Google, which became the go-to source for consumers because its algorithm offered substantial improvements over the others' labor-intensive and often inconsistent methods. All this raises a question we will return to in future chapters: Is there a first-mover advantage for disruptive innovators? If so, under what circumstances? Most often, it pays to be the second or third entry into the market that provides the sustaining innovation.

Innovators and Entrepreneurs: A Comparison

Why did the world's first disruptive media innovator fail to capitalize on his own inventions? From a distance of more than 550 years, we can raise a number of questions about business decisions Gutenberg made. All of these are instructive for modern-day entrepreneurs.

In the popular press, the words "innovator" and "entrepreneur" are often used interchangeably. However, dictionaries offer very different definitions. An innovator,

according to the Cambridge English Dictionary, is someone “who develops a new product, design, etc. or who has new ideas about how to do something.” An entrepreneur, according to the Merriam-Webster Dictionary, is a person “who organizes, manages and assumes the risks of a business or enterprise.” In other words, an innovator is an inventor while an entrepreneur is a business person.

Nevertheless, in today’s digital era, it is possible to be both a successful innovator and entrepreneur since they share many of the same traits. Steve Jobs and Jeff Bezos immediately come to mind. A six-year study, conducted by professors at three of the country’s leading business schools, sought to identify the “secret sauce” shared by successful “innovative entrepreneurs.” After studying the habits of 25 well-known innovators and interviewing more than 3,500 executives and individuals who had started or worked for innovative companies, the professors identified five skills that make up the “DNA” of successful innovative entrepreneurs: associating, questioning, observing, experimenting, and networking. They concluded that the first two—associating and questioning—were the most critical skills.

- *Associating*: The ability to connect problems or ideas from different areas. For example, Gutenberg was able to connect what he learned from metallurgy to the production of moveable type.
- *Questioning*: The ability to ask provocative questions that challenge the status quo. The study noted successful innovators begin by asking “Why?” and then proceed to asking “Why not?” and “What if?” Gutenberg questioned why a printing press couldn’t produce a book of the same quality as that of a scribe.
- *Observing*: The ability to gain insights by observing how others use an existing product and the frustrations they encounter. Gutenberg observed the inconsistencies in quality and the length of time it took to produce a Bible produced by a scribe, as well as the subsequent frustrations such lapses elicited from customers.
- *Experimenting*: The ability to engage in active learning in multiple environments. Gutenberg experimented with multiple products—ink and paper, moveable type, printing presses—and then connected the dots to bring all the processes together.
- *Networking*: The passion for meeting diverse people in diverse settings, with the goal of incorporating diverse perspectives and ideas into your experimentation and innovation. Gutenberg traveled up and down the Rhine, engaging in numerous ventures—from reflective mirrors to coinage. He incorporated many of these diverse perspectives into his experimentation with the printing press.

If Gutenberg possessed all of these traits, why then did he fail as an entrepreneur or business executive? Management shortcomings are the most commonly-cited reasons for entrepreneurial failure. As Peter Drucker observed in his 1985 book, *Innovation and Entrepreneurship*:

Unless a new venture develops into a new business and makes sure of being “managed,” it will not survive, no matter how brilliant the entrepreneurial idea, how much money it attracts, how good its products, nor even how great the demand for them.

In a 2017 study, Joseph Picken identified the “eight hurdles of transition” (Table 1.1) and prescribed the essential actions to be taken by entrepreneurs as they transition their companies from a nascent start-up to a business capable of sustained and profitable growth.

Table 1.1 Laying the foundation for a sustainable and profitable business.

Set a direction and maintain focus	Clearly define goals and objectives, but fine-tune the details of implementation as required
Position products/services for an expanded market	Refine your offering and fine-tune customer relationships as you expand your market
Maintain customer/market responsiveness	Develop processes to ensure that the organization remains flexible and responsive to customers
Build an organization and management team	Hire key skills and develop organizational capabilities to address the challenges of growth
Develop effective processes and infrastructures	Establish and adapt customer-facing, production and management infrastructures consistent with growth
Build financial capability	Beyond raising initial capital – demonstrate the ability to prudently manage financial resources
Develop an appropriate culture	Shape and reinforce a culture that supports the business purpose and strategy of the firm
Manage risks and vulnerabilities	Understand and proactively manage risks and vulnerabilities

Source: Picken (2017).

Using this template, we can ask the following questions:

- *Did Gutenberg understand the finances of his own operation and develop efficient processes?* Gutenberg does not seem to have thought ahead and managed either the revenues or costs of his operation. From 1450 to 1455, the only source of income for Gutenberg's enterprise came from the printing of indulgences, textbooks, and pamphlets. Most of Gutenberg's 20 employees appear to have been working on the Bible, not on the tasks that brought in revenue. If Gutenberg had employed a salesman to drum up more of this sort of hum-drum printing business, he might not have had to ask Fust for a second round of financing, which came with much more stringent terms than the initial cash outlay. On the cost side, he doesn't seem to have maximized his use of capital and his labor force. It's unclear how Gutenberg divided the work, or how many employees had specialized skills—such as type casting or ink formulation—that would have made the Bible-printing operation more efficient.

Lesson for today's entrepreneurs: Successful media entrepreneurs are focused on both the efficiency of their operation as well as cash flow (the money they have on hand to pay the bills). Book publishers, for example, balance the risk of publishing a book by an unknown author, which may yield little or no money, by simultaneously releasing titles by best-selling authors with a proven track record for sales. Printing firms today operate around the clock, efficiently utilizing all equipment. Employees have specialized skills and clear accountability for certain tasks. They understand how their work fits into the overall process. Everyone has responsibility for making sure there is a smooth transition between each stage from creation to packaging to distribution. In Chapter 2 ("The Story behind the Numbers"), we'll discuss what sort of information can be gleaned from financial statements, and in Chapter 3 ("What Is a Company Worth?"), we'll discuss how to calculate the financial value of an enterprise.

- *Did Gutenberg appropriately manage the risks and vulnerabilities inherent in a start-up?* Gutenberg was intent on reproducing a Bible of the highest quality, equal to or surpassing texts produced by the best scribes in Europe. Critics today herald his

two-volume Bible as an artistic masterpiece, using words like “beautiful” to describe both the type and design. But while Gutenberg was constantly adjusting the formulas and experimenting in his quest for artistic perfection, he blew through deadlines that he and Fust had agreed on. Artists strive for perfection without a clear notion of return on investment. In contrast, successful entrepreneurs understand there is a trade-off between quality and return on investment. They are constantly assessing whether something is “good enough” to go to market.

Lesson for today’s entrepreneurs: Studies have shown that founders of start-up enterprises tend to significantly underestimate the time it will take them to get their product to consumers. As the adage goes, if something can go wrong, it will. This is especially true when designing and manufacturing a new product. That is why successful entrepreneurs engage in contingency planning, constructing various scenarios to understand the impact delay will ultimately have on the bottom line. They also hold themselves and their employees accountable to meeting deadlines and expectations. In Chapter 5, we’ll lay out “A Strategy for Dealing with the New Business Imperatives,” and in Chapter 10, we’ll discuss “Investing in Key Assets and Capabilities” that drive profitability.

- *Did Gutenberg devote sufficient attention to positioning his product in the market and establishing sales and distribution channels that would allow him to respond to customer demand?* Based on accounts in the few court documents that survive, Gutenberg apparently devoted very little time to establishing an efficient system for pricing, selling, and fulfilling orders. Even before he had acquired Gutenberg’s workshop and his Bibles, Fust was apparently lining up customers throughout Europe and establishing a reliable distribution system. A mere 20 years after taking over operation of the print shop where he had apprenticed under Gutenberg, Schoeffer had developed a sales and distribution network that stretched across Western Europe. Through this network, he pushed sales of books he both produced and authored—including a Bible and a guide to herbs—as well as those he printed for other writers and organizations. All carried his branded imprint, which was stamped on the cover and differentiated his publications from his competitors.

Lesson for today’s entrepreneurs: This may have been Gutenberg’s most fatal business error. Successful media entrepreneurs maximize sales and profits by focusing not only on the quality of the content that is produced, but also on the quality of their marketing, sales, and distribution systems. They estimate the size of the target market and optimal pricing, then use the most efficient channels to get their content to their customers and build loyalty. In Chapters 6, 7, 8, and 9, we’ll discuss: “Defining a Unique Value Proposition,” “Understanding Customer Relationships in a Digital World,” “Reaching Current and New Customers,” and “Competing in a Networked World.”

- *How well did Gutenberg set a direction for his venture, maintain focus and choose the right partners and employees?* Some biographers have speculated that his apprentice Schoeffer was one of the world’s first industrial spies, placed in Gutenberg’s workshop by his angel investor, Fust, to learn the secret formula. They point out that Fust foreclosed on the loan just as the first Bibles were coming off the press, and that testimony in court from Schoeffer tipped the verdict in Fust’s favor. The retail value of the Bibles, alone, was more than three times as much as the original loan of 1,600 guilders. With the proceeds from the sale of the Bibles, Fust and Schoeffer set up their own successful print operation, using the equipment they confiscated from Gutenberg’s shop. Today we have copyright and patent laws that protect inventors from the theft of intellectual

property by a competitor, and confidentially agreements that are binding on employees and potential investors. While Gutenberg lacked such legal protections, he doesn't seem to have taken adequate precautions to safeguard his "secret project," nor does he seem to have articulated a strategy with clear goals and objectives and devised a sustainable economic model for his enterprise.

Lesson for today's entrepreneurs: Things might have turned out differently if Gutenberg had chosen better business partners and had a focused vision for his enterprise, beyond that of simply producing a "beautiful" Bible. That is why founders of media start-ups today should proceed deliberately when seeking initial investors and choosing an initial management team. Reputable investors exhaustively cull through the entrepreneur's financial statement, before working with founders to establish agreed-upon targets on everything from launch date to audience metrics and projected operating expenses. Members of the management team need to understand their individual and interrelated roles and responsibilities, and work with the founder to define and refine a clear strategic direction for the company. In Chapter 4 we'll discuss "The Transformed Competitive Landscape," and in Chapter 11 we'll discuss "Entrepreneurial Leadership and Culture."

By the end of the fifteenth century, there were as many as eight million books printed by machine circulating in Western Europe. Early publishing entrepreneurs, such as Schoeffer, succeeded by building an integrated business model that we still employ today.

- They focused on producing, marketing, and distributing unique content that differentiated their shops from the other 200 or so competing publishers in Europe, and began pushing for rules, regulations, and industry guidelines that would protect their intellectual property from theft.
- They worked out a division of labor in the production process that kept their enterprise operating at maximum capacity, even as they looked outward and began developing marketing and sales expertise.
- They understood the underlying economics of each phase in the production and distribution cycle and began to calculate a rudimentary return on investment for each product they produced.

Gutenberg was a transitional figure—more innovative artist than entrepreneur. As such, he failed to grasp the underlying economics of the new processes and procedures he was inventing. Managers of today's media enterprise have to balance the costs involved in creating, packaging, and distributing content against the revenue expected from either selling content directly to consumers, or selling an audience to advertisers. This means that a successful media entrepreneur must develop an economic mastery of the processes and procedures necessary to produce and distribute a firm's unique content, and a strategic understanding of how the processes come together to create a book, television show, or online site that attracts paying customers.

Mark Zuckerberg: Innovator and Entrepreneur?

In February 2014, as Facebook celebrated its tenth anniversary, CEO Mark Zuckerberg declared that he was "even more excited about the next ten years than the last. The first ten years were about bootstrapping this network. Now we have the resources to help people across the world solve even bigger and more important problems."

Borrowing designs and programs from existing sites such as Friendster, Zuckerberg had famously launched Facebook on February 4, 2004 from his dorm room at Harvard during his sophomore year. Word spread rapidly around the campus about the new social networking site, which Zuckerberg described as a service that would help students at the large university “connect” with their friends and keep abreast of what they were doing. Within 24 hours, more than 1,200 Harvard students had registered; within one month, more than half of all students. Zuckerberg and a handful of his college dorm mates and friends began offering the service to other Ivy League schools and Boston-area universities.

Excited over the business prospects of this new social network he had created, Zuckerberg decided that summer to leave school and set up headquarters in a ranch house in Palo Alto. Peter Thiel, co-founder of PayPal, joined the board of advisers and became an initial investor, contributing \$500,000 for a 10 percent ownership in the young company. He was joined a year later by Accel Partners, which made a \$12.7 million investment. By fall 2005, Facebook had more than five million users, with more than 85 percent of college students connected to the network. Next Facebook targeted high school students. By the end of 2005, Facebook was active in more than 2,000 colleges and 25,000 high schools. In September 2006, it was opened to everyone over 13 years old with a valid e-mail address.

By then, Facebook had already received another round of money (\$27.5 million) from venture capitalists. It was also beginning to receive unsolicited offers from other companies, including Yahoo!, which offered to pay one billion dollars to purchase the company, and Microsoft, which in 2007 bought a 1.6 percent stake in Facebook that implied a \$15 billion value for the three-year-old social networking site. On the advice of his investors and board, Zuckerberg began looking for a seasoned executive who could help him develop a sustainable business model. (Unlike some of his contemporaries, such as the Google founders, Zuckerberg did not want to give up the CEO title, so he sought COO candidates.) In 2008, he hired Sheryl Sandberg, a Google advertising executive, for the position. After holding a number of brainstorming sessions with Facebook employees, she concluded that advertising should be the main source of revenue for Facebook and began working on building a sales structure.

As he had from the beginning, Zuckerberg continued to focus primarily on improving the utility of the site and the quality of the user experience. Noticing the rapid adoption of smartphones, the company moved swiftly to adapt its platform for mobile usage. Facebook also began to add capabilities by acquiring other companies, including WhatsApp (encrypted mobile messaging), Instagram (mobile photo-sharing), and Oculus (virtual reality).

In 2012, Facebook filed for an initial public offering (IPO) of its stock. Demand for the stock was high, and underwriters priced shares at 38 dollars each, giving the company a valuation of \$104 billion, the largest of any newly public company yet. However, in what was perhaps an omen of the year to come, a computer glitch on the NASDAQ on the day of the IPO, May 18, delayed trading. Facebook stock struggled all day to stay above the opening price. Over the coming months, the stock fell as low as 18 dollars a share before beginning to rebound.

By 2014, two years after its debut, with the stock trading around 62 dollars a share, both its founder and investors were once again optimistic. Three years later, by February 2017, Facebook's stock price had doubled to \$137 a share. By October 2017, Facebook had a stock market valuation of \$497 billion, making it the fourth largest public company in the world, exceeded only by Apple, Alphabet (the parent company of Google) and Microsoft.

During the first ten years of its existence, there were several inflexion points when Zuckerberg and Sandberg made critical decisions that influenced the long-term viability of Facebook as an enterprise. This included Zuckerberg's choice of investors and COO, his focus on the quality of the user experience, Sandberg's decision to aggressively seek advertising revenue to support Facebook's business model, and the company's agile response to changes in the marketplace, such as the adoption of the smartphone by its customers.

We conclude this first chapter by comparing and contrasting the different fates of two media pioneers, Zuckerberg and Gutenberg.

- Is Facebook a disruptive innovation—like the printing press—or a sustaining one?
- Given the fast pace of innovation and technological change, what immediate and long-term challenges and opportunities will Facebook confront?
- How will its business model evolve?
- Finally, why did Zuckerberg succeed as an entrepreneur, in contrast to Gutenberg?

Summary

Gutenberg's invention propelled civilization and communication into a new era. Over the past 550 years, technological progress has occurred at an increasing pace. The print era lasted from 1450 to 1900, followed by the electronic era, which lasted for a century. We are still in the early years of the digital era, which began at the end of the twentieth century.

In each era, there are disruptive innovations—such as the invention of the Gutenberg press—and sustaining innovations—such as the steam-powered rotary press. Both types of innovation have the ability to alter the economics of a media enterprise.

Nevertheless, all media enterprises share common characteristics, processes and procedures. A media company is an organization that creates content, packages that content into a product or service (such as a book or television show), and then distributes it to consumers. Over the past two centuries, two types of media business models have emerged. Book publishers, motion picture studios, and video games sell their content directly to consumers. In contrast, newspapers, magazines, television stations, and digital giants such as Google and Facebook sell their audiences to advertisers.

Innovators and entrepreneurs share many of the same traits—including an ability to question the status quo. But, not all innovators are successful entrepreneurs. In this book, we will be exploring how founders of start-ups, as well as executives in legacy media companies, become successful entrepreneurs, as well as innovative leaders.

