

Faculty of Computer Science & Information Technology

Department of Information Technology

4th year – 7th Semester

E-commerce

Chapter 1: The Revolution Is Just Beginning

The First Thirty Seconds

- First 20 years of e-commerce
 - Just the beginning
 - Rapid growth and change
- Technologies evolve at exponential rates
 - Disruptive business change
 - New opportunities
- Why study e-commerce
 - Understand opportunities and risks
 - Analyze e-commerce ideas, models, issues

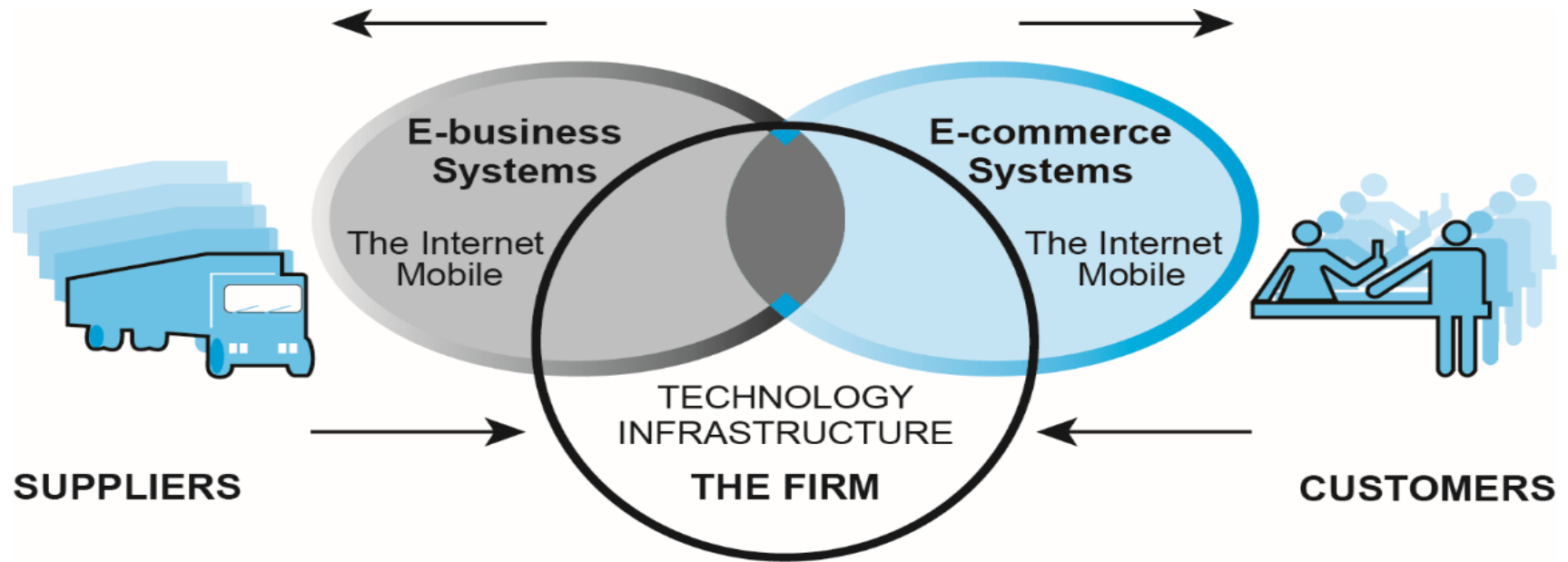
Introduction to E-commerce

- Use of Internet to transact business
 - Includes Web, mobile browsers and apps
- More formally:
 - Digitally enabled commercial transactions between and among organizations and individuals

The Difference Between E-commerce and E-business

- E-business:
 - Digital enabling of transactions and processes within a firm, involving information systems under firm's control
 - Does not include commercial transactions involving an exchange of value across organizational boundaries

The Difference Between E-commerce and E-business



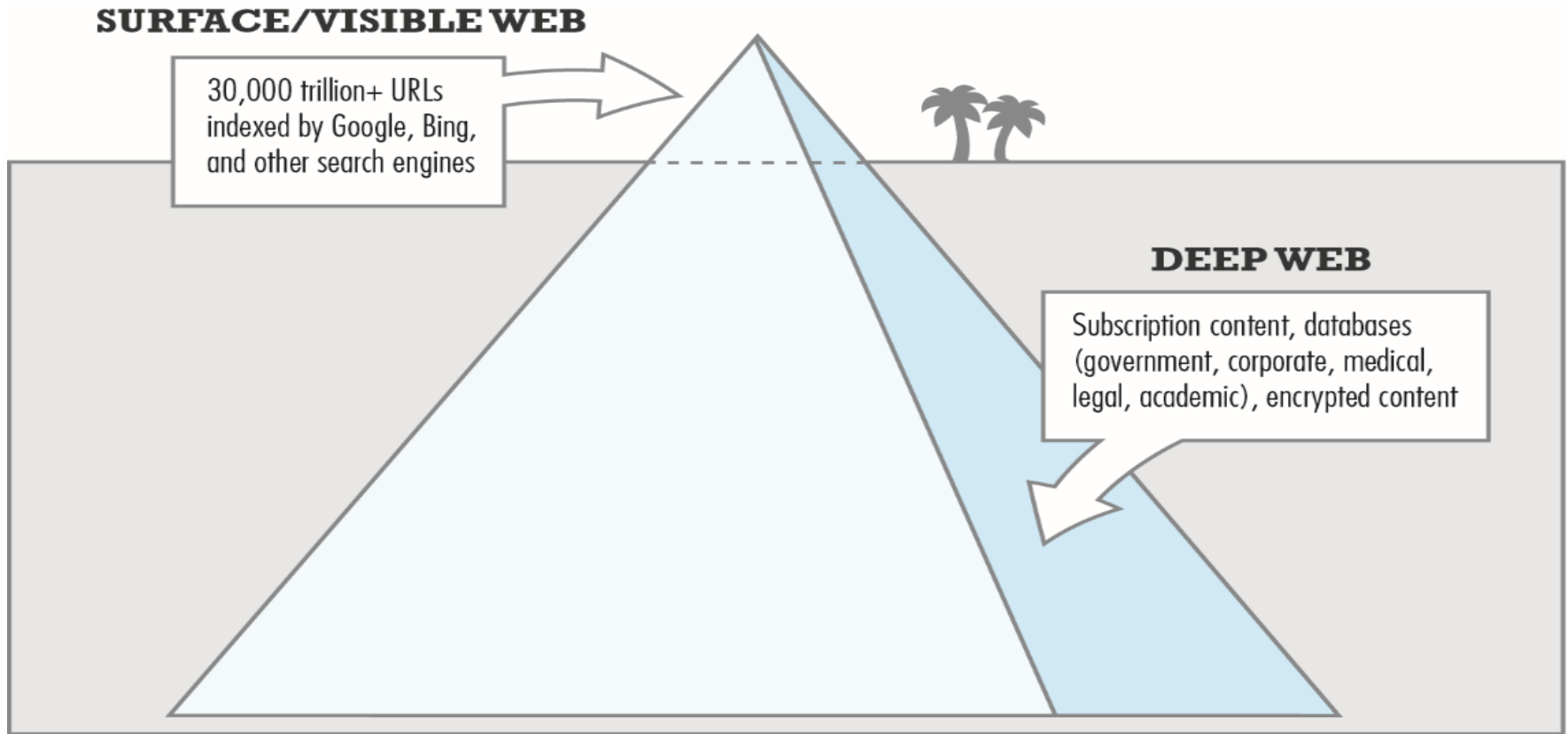
E-commerce primarily involves transactions that cross firm boundaries. E-business primarily involves the application of digital technologies to business processes within the firm.

Technological Building Blocks Underlying E-commerce

- Internet
- World Wide Web
 - HTML
 - Deep Web vs. “surface” Web
- Mobile platform
 - Mobile apps

The **mobile platform** provides the ability to access the Internet from a variety of mobile devices such as smartphones, tablets, and other ultra-lightweight laptop computers via wireless networks or cell phone service.

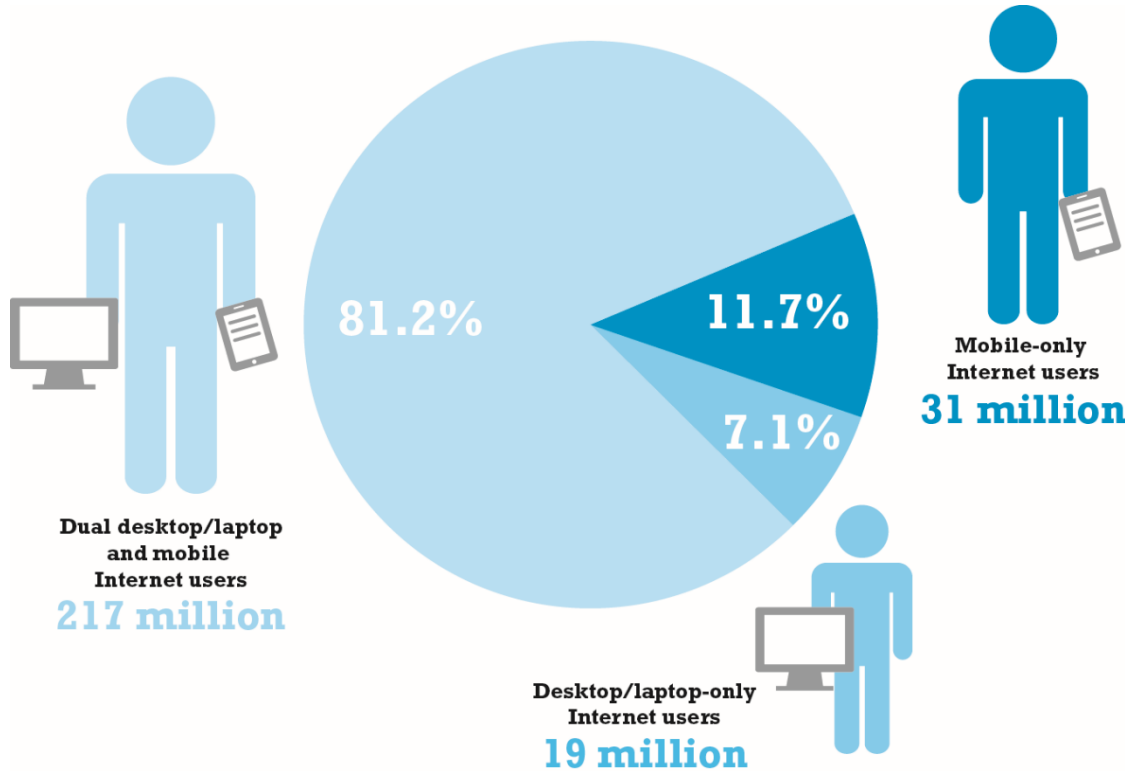
Technological Building Blocks Underlying E-commerce (Deep Web vs. “surface” Web)



Deep Web is reportedly 500 to 1,000 times greater than the surface Web. The deep Web contains databases and other content that is not routinely indexed by search engines such as Google

Technological Building Blocks Underlying E-commerce

(INTERNET ACCESS IN THE UNITED STATES, 2016)



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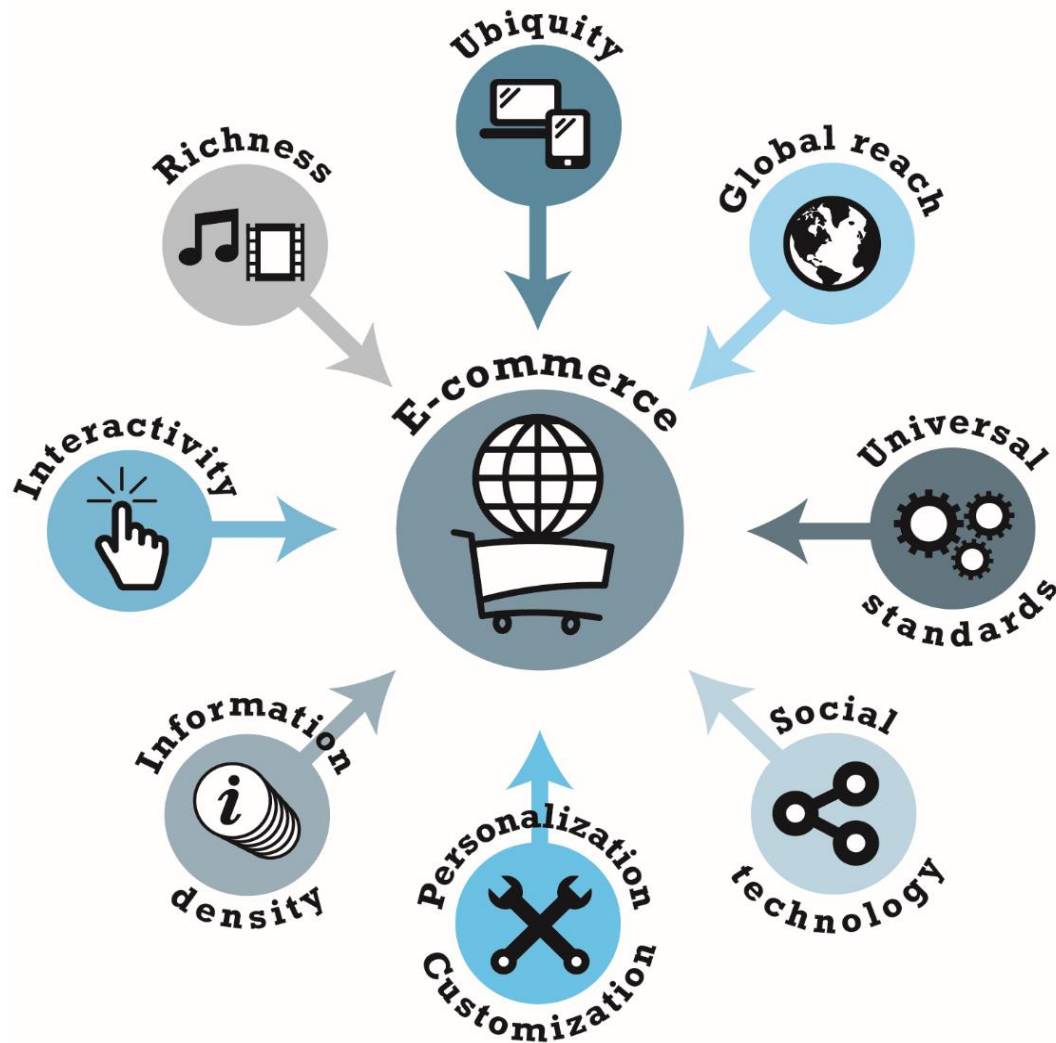
SOURCE: Based on data from eMarketer, Inc., 2016c.

- ✓ Over 80% of all Internet users in the United States (217 million people) go online using both a desktop/laptop and mobile device.
- ✓ Almost 12% (31 million) only go online by using a mobile device.
- ✓ Just over 7% (19 million) use only a desktop or laptop computer to access the Internet.

Insight on Technology: Will Apps Make the Web Irrelevant? *Some Highlights*

- In January 2014, for the first time ever, Americans used mobile apps more than desktop computers to access the Internet.
- Consumers have gravitated to apps for several reasons:
 - Smartphones and tablet computers enable users to use apps anywhere, instead of being tethered to a desktop or having to lug a heavy laptop around.
 - Apps are often more convenient and boast more streamlined, elegant interfaces than mobile web browsers.
- Apps are much more appealing to content creators and media companies.
- Apps and the Web are going to come together, with HTML5 bringing the best of the app experience to the Web, and with apps developing new web-like capabilities.

Unique Features of E-commerce Technology



- ✓ E-commerce technologies provide 8 unique features that have impacted the conduct of business.
- ✓ These unique dimensions of e-commerce technologies suggest many new possibilities for marketing and selling—a powerful set of interactive, personalized, and rich messages are available for delivery to segmented, targeted audiences.

Unique Features of E-commerce Technology

1. Ubiquity:

- Available just about everywhere, at all times.
- Marketspace is virtual (migration from marketplace to marketspace).
- Transaction costs reduced (the costs of participating in a market).
- Example: being able to surf the web on your mobile device while riding a bus or train.

2. Global reach

- Transactions cross cultural and national boundaries.
- The potential market size for e-commerce merchants is roughly equal to the size of the world's online population.

Unique Features of E-commerce Technology

3. Universal standards:

- Standards that are shared by all nations around the world.
- lower market entry costs—the cost merchants must pay just to bring their goods to market.
- Reduce search costs—the effort required to find suitable products.
- Price discovery becomes simpler, faster, and more accurate.
- Possible to easily find many of the suppliers, prices, and delivery terms of a specific product anywhere in the world

4. Information richness

- Refers to the complexity and content of a message.
- Supports video, audio, and text messages.
- Are interactive and can adjust the message to individual users.

Unique Features of E-commerce Technology

5. Interactivity

- technology that allows for two-way communication between merchant and consumer and among consumers.
- Interactivity allows an online merchant to engage a consumer in ways similar to a face-to-face experience.
- Comment features, community forums, and social networks with social sharing functionality such as Like and Share buttons all enable consumers to actively interact with merchants and other users.
- Example: using a chat window to interact with technical support at a merchant's website.

Unique Features of E-commerce Technology

6. Information density

- the total amount and quality of information available to all market participants, consumers and merchants alike.
- information becomes more plentiful, less expensive, and of higher quality.
- reduction in **information asymmetry** among market participants (consumers and merchants).
- More **Price transparency**: the ease with which consumers can find out the variety of prices in a market.
- More **cost transparency**: the ability of consumers to discover the actual costs merchants pay for products.
- Allows for greater **market segmentation and price discrimination**: selling the same goods, or nearly the same goods, to different targeted groups at different prices.

Unique Features of E-commerce Technology

7. Personalization/customization

- personalization: merchants can target their marketing messages to specific individuals by adjusting the message to a person's name, interests, and past purchases.
- customization—changing the delivered product or service based on a user's preferences or prior behavior.
- A result of increased information density.

8. Social technology

- much more social by allowing users to create and share content with a worldwide community.
- E-commerce technologies provide a unique, many-to-many model of mass communication.

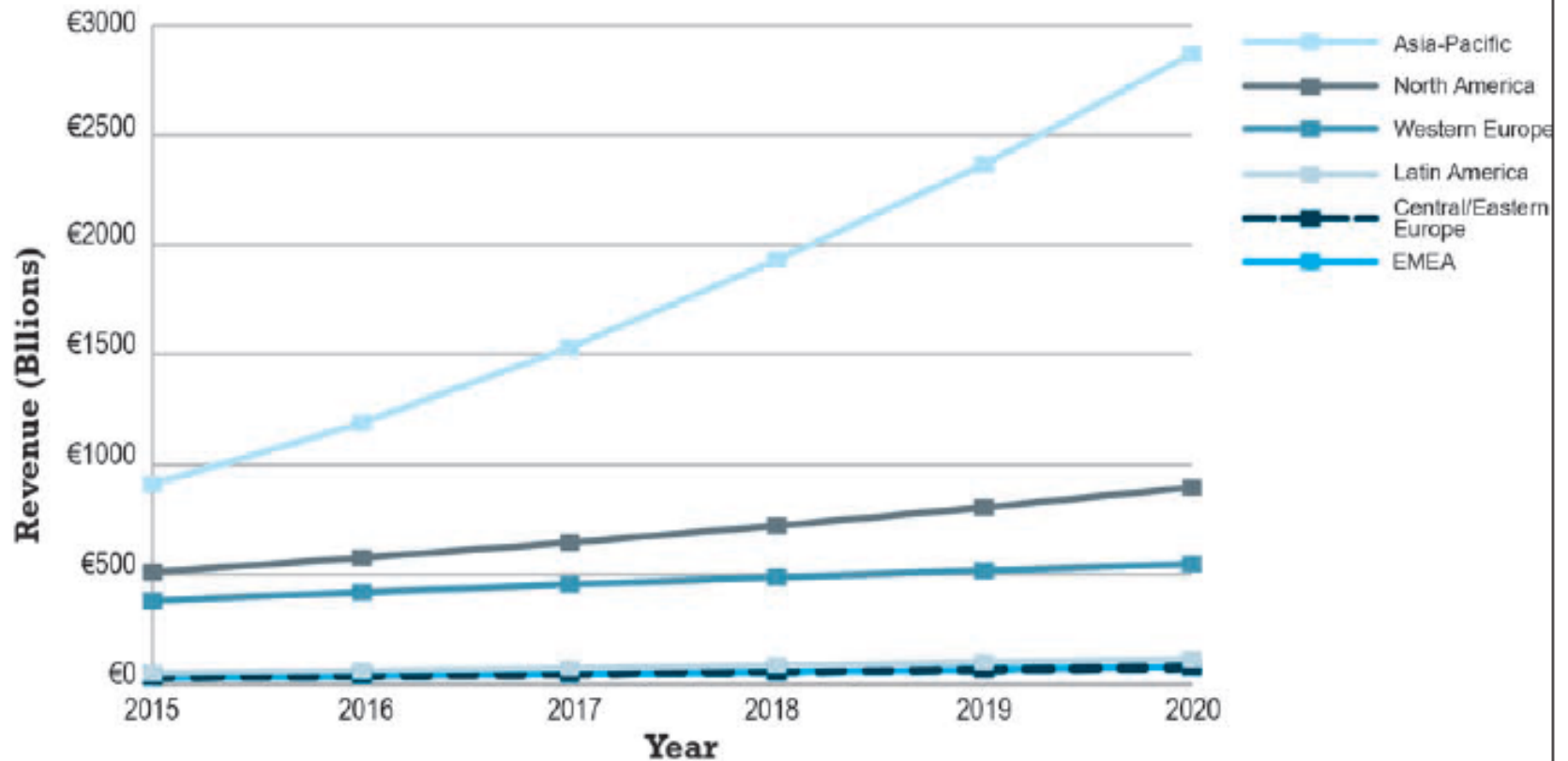
Types of E-commerce

- Business-to-Consumer (B2C)
- Business-to-Business (B2B)
- Consumer-to-Consumer (C2C)
- Mobile e-commerce (M-commerce)
- Social e-commerce
- Local e-commerce

The Growth of B2C E-commerce Worldwide

FIGURE 1.5

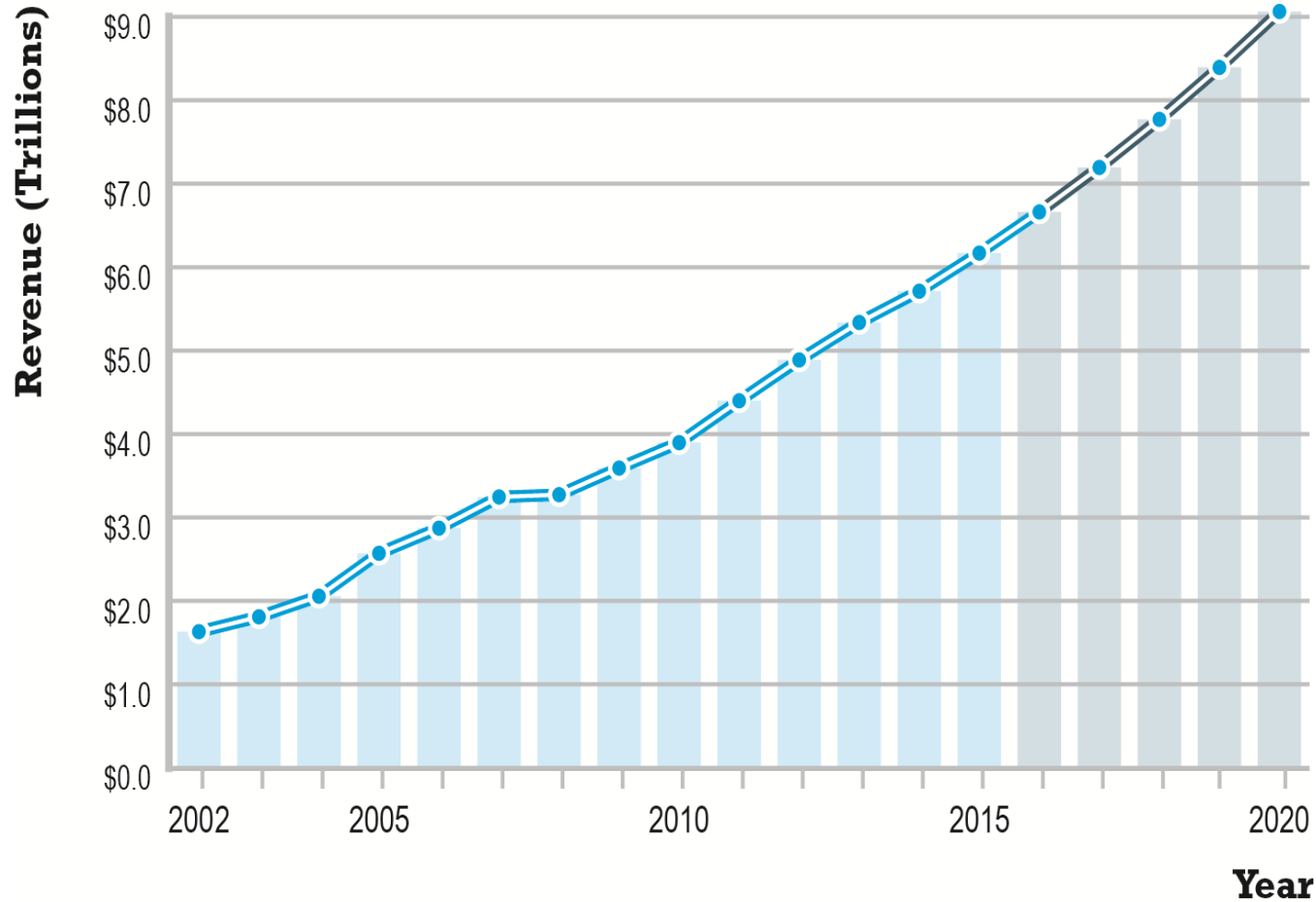
THE WORLDWIDE GROWTH OF B2C E-COMMERCE



B2C e-commerce is growing rapidly in all regions. Overall global growth is over 22% and is even higher in Asia-Pacific.

SOURCES: Based on data from eMarketer, Inc., 2016e, 2016f.

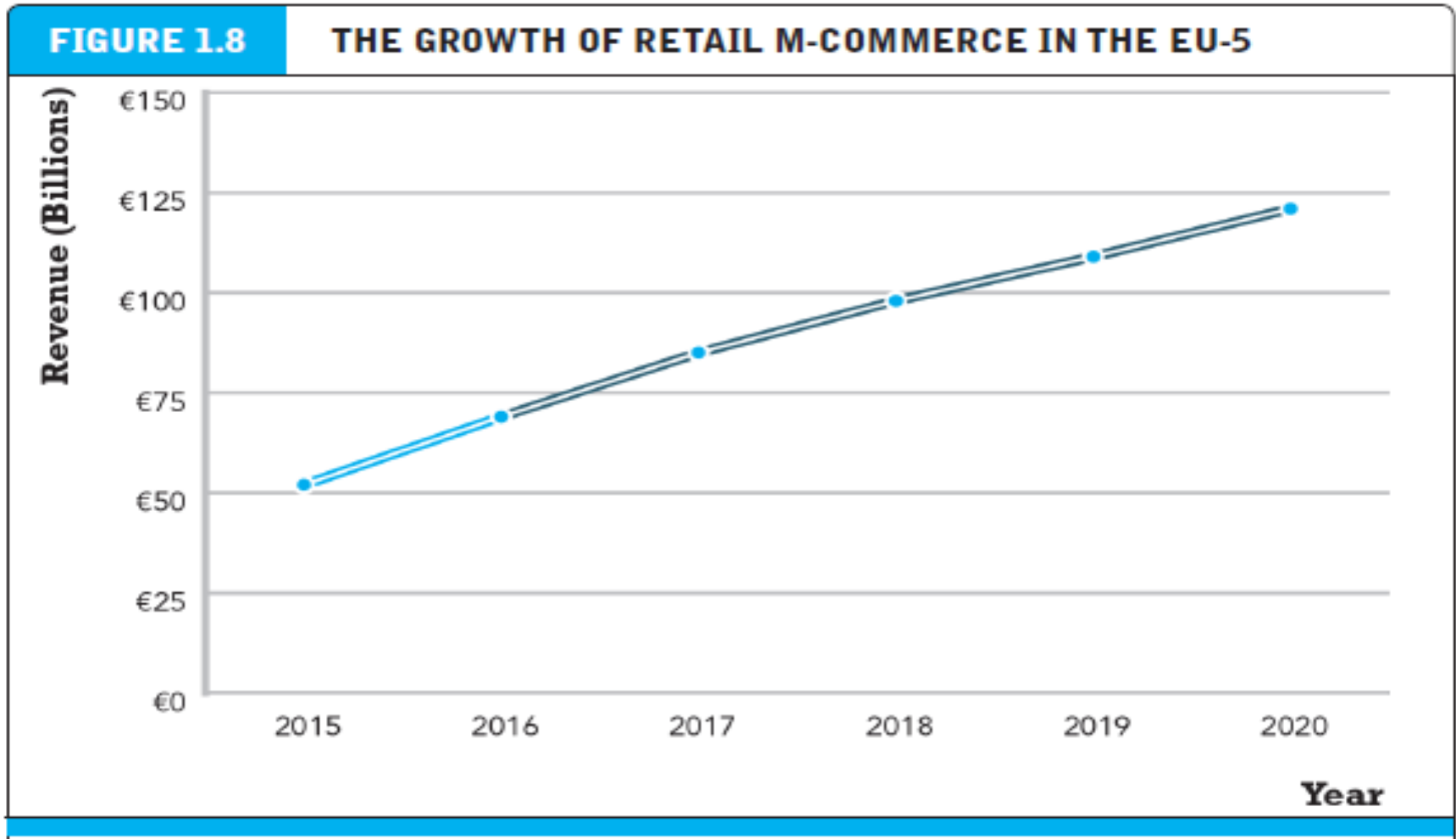
The Growth of B2B E-commerce in the U.S.



- ✓ B2B e-commerce in the United States is about 10 times the size of B2C e-commerce.
- ✓ In 2020, B2B e-commerce is projected to be over \$9 trillion. (Note: Does not include EDI transactions.)

SOURCES: Based on data from U.S. Census Bureau, 2016; authors' estimates.

The Growth of M-commerce in the EU5



It is anticipated that retail m-commerce will continue to grow at double-digit rates over the next five years as consumers become more and more accustomed to using mobile devices to purchase products and services.

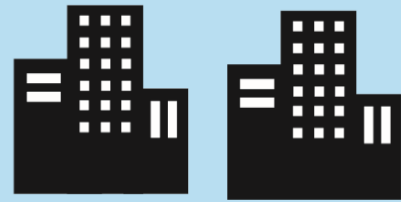
Social E-commerce

- ✓ **Social e-commerce** is e-commerce that is enabled by social networks and online social relationships.
- ✓ The growth of social e-commerce is being driven by a number of factors, including:
 - social sign-on (signing onto websites using your Facebook or other social network ID)
 - network notification (the sharing of approval or disapproval of products, services, and content),
 - online collaborative shopping tools.
 - social search (recommendations from online trusted friends), and
 - the increasing prevalence of integrated social commerce tools such as Buy buttons

Local E-commerce

- ✓ form of e-commerce that is focused on engaging the consumer based on his or her current geographic location.
- ✓ Local merchants use a variety of online marketing techniques to drive consumers to their stores.

The relative size of different types of E-commerce in the US



B2B
\$6.7
trillion



C2C
\$100
billion



Social \$3.9 billion

Local \$40+ billion



Mobile
\$180 billion



B2C
\$600
billion

- ✓ B2B e-commerce dwarfs all other forms of e-commerce;
- ✓ mobile, social, and local e-commerce, although growing rapidly, are still relatively small in comparison to “traditional” e-commerce.

E-commerce: A Brief History (1 of 4)

Precursors (before e-commerce)

- Baxter Healthcare modem-based system
- Order entry systems
- Electronic Data Interchange (EDI) standards
- French Minitel (videotext system that combined a telephone with an 8-inch screen).
 - more than 3 million had been deployed, with more than 13,000 different services available, including ticket agencies, travel services, retail products, and online banking.
 - continued in existence until December 31, 2006, when it was finally discontinued by its owner, France Telecom.

E-commerce: A Brief History (2 of 4)

1995–2000: Invention

- Sale of simple retail goods
- Limited bandwidth and media
- Euphoric visions
 - Friction-free commerce: a vision of commerce in which information is equally distributed, transaction costs are low, prices can be dynamically adjusted to reflect actual demand, intermediaries decline, and unfair competitive advantages are eliminated.
 - First-mover advantages
- Dot-com crash of 2000

E-commerce: A Brief History (2 of 4)

1995–2000: Invention

- ✓ Internet and digital markets have changed the way companies conduct business
- ✓ Information asymmetry reduced:
 - refers to any disparity in relevant market information among parties in a transaction.
 - nearly perfect competitive market: where price, cost, and quality information are equally distributed.
- ✓ Menu costs, search and transaction costs reduced.
 - national or regional prices in traditional retailing (what are called menu costs) that one national price was the norm.
 - merchants know much more about consumers and are able to use this information more effectively than was ever true in the past.
 - It is possible for merchants to know more about other merchants than was ever true in the past.

E-commerce: A Brief History (2 of 4)

1995–2000: Invention

✓ For merchants & Producers (friction-free commerce):

- direct access to hundreds of millions of customers.
- the **cost of searching** for customers would also fall, reducing the need for wasteful advertising.
- advertisements could be **personalized** to the needs of every customer.
- producers could **dynamically price** their products to reflect actual demand, ending the idea of one national price, or one suggested manufacturer's list price.
- Allow for **price discrimination**: selling the same goods, or nearly the same goods, to different targeted groups at different prices.
- The resulting intense competition, the decline of intermediaries, and the lower transaction costs would eliminate product brands, and along with these, the possibility of **monopoly profits** based on brands, geography, or special access to factors of production.
- prices covered costs of production plus a fair, "**market rate**" of return on capital, plus additional small payments for entrepreneurial effort (that would not last long).
- **Unfair competitive advantages** (which occur when one competitor has an advantage others cannot purchase) would be reduced.

E-commerce: A Brief History (2 of 4)

1995–2000: Invention

✓ For real-world entrepreneurs:

- The e-commerce marketplace represented access to millions of consumers worldwide who used the Internet and a set of marketing communications technologies (e-mail and web pages) that was universal, inexpensive, and powerful.
- Allows better segmentation, targeting, and positioning.
- Extraordinary profits would go to **first movers—those** firms who were first to market in a particular area and who moved quickly to gather market share.
- inhibit competitors (new entrants) by building in **switching costs** for their customers through proprietary interface designs and features available only at one site. The idea for entrepreneurs was to create near monopolies online based on size, convenience, selection, and brand.
- creating a **network effect** that occurs where users receive value from the fact that everyone else uses the same tool or product.
- The emphasis was on **disrupting (destroying)** traditional distribution channels and disintermediating existing channels, using new pure online companies who aimed to achieve impregnable first-mover advantages.

E-commerce: A Brief History (2 of 4)

1995–2000: Invention

✓ For Consumers:

- search costs—the cost of searching for prices, product descriptions, payment settlement, and order fulfillment—would all fall drastically.
- Prices and even costs would be increasingly transparent to the consumer, who could now know exactly and instantly the worldwide best price, quality, and availability of most products (reduced information asymmetry).

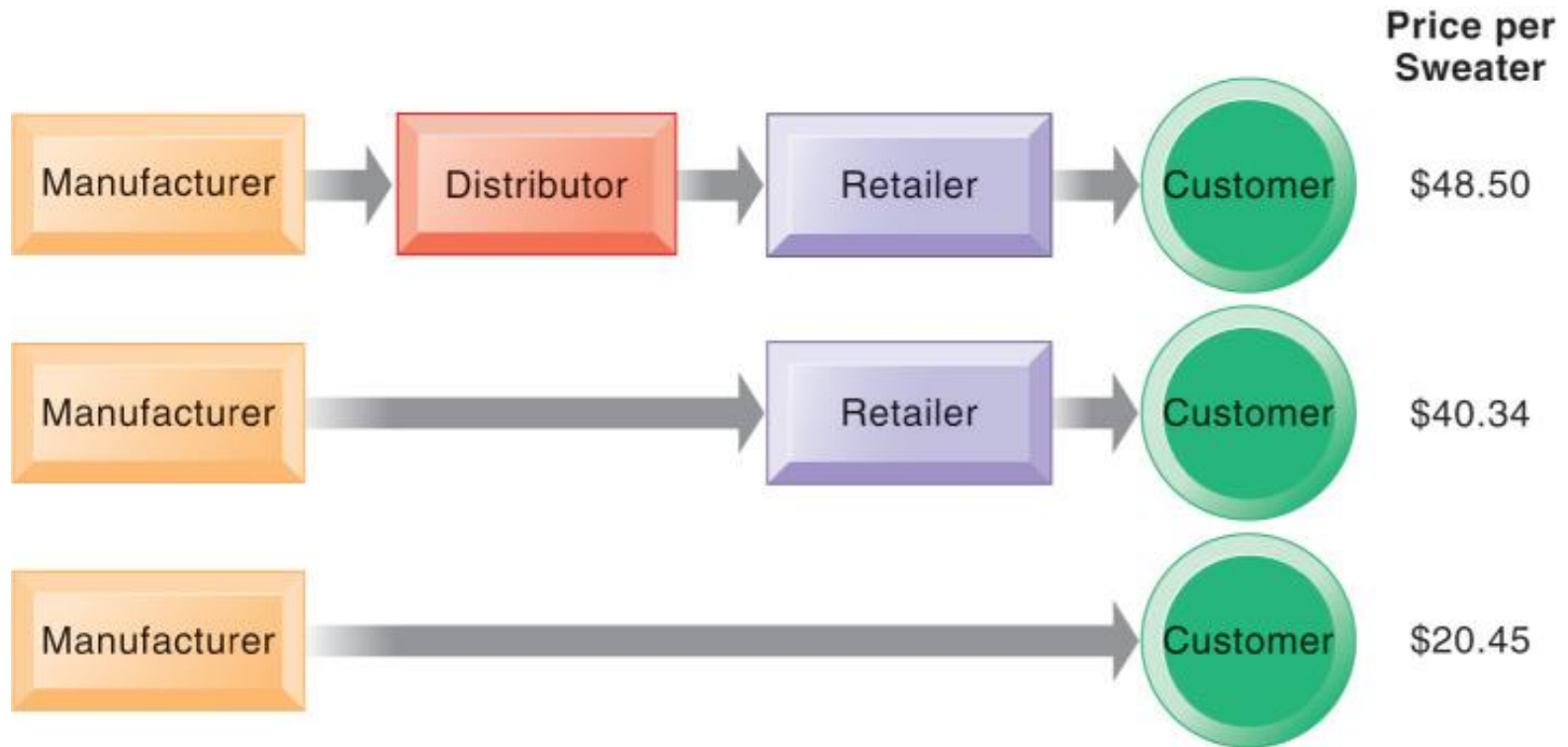
✓ For Distributors and Wholesalers:

- Disintermediation: displacement of market middlemen who traditionally are intermediaries between producers and consumers by a new direct relationship between producers and consumers.

E-commerce: A Brief History (2 of 4)

1995–2000: Invention

The Benefits of Disintermediation to the Consumer



E-commerce: A Brief History (3 of 4)

2001–2006: Consolidation

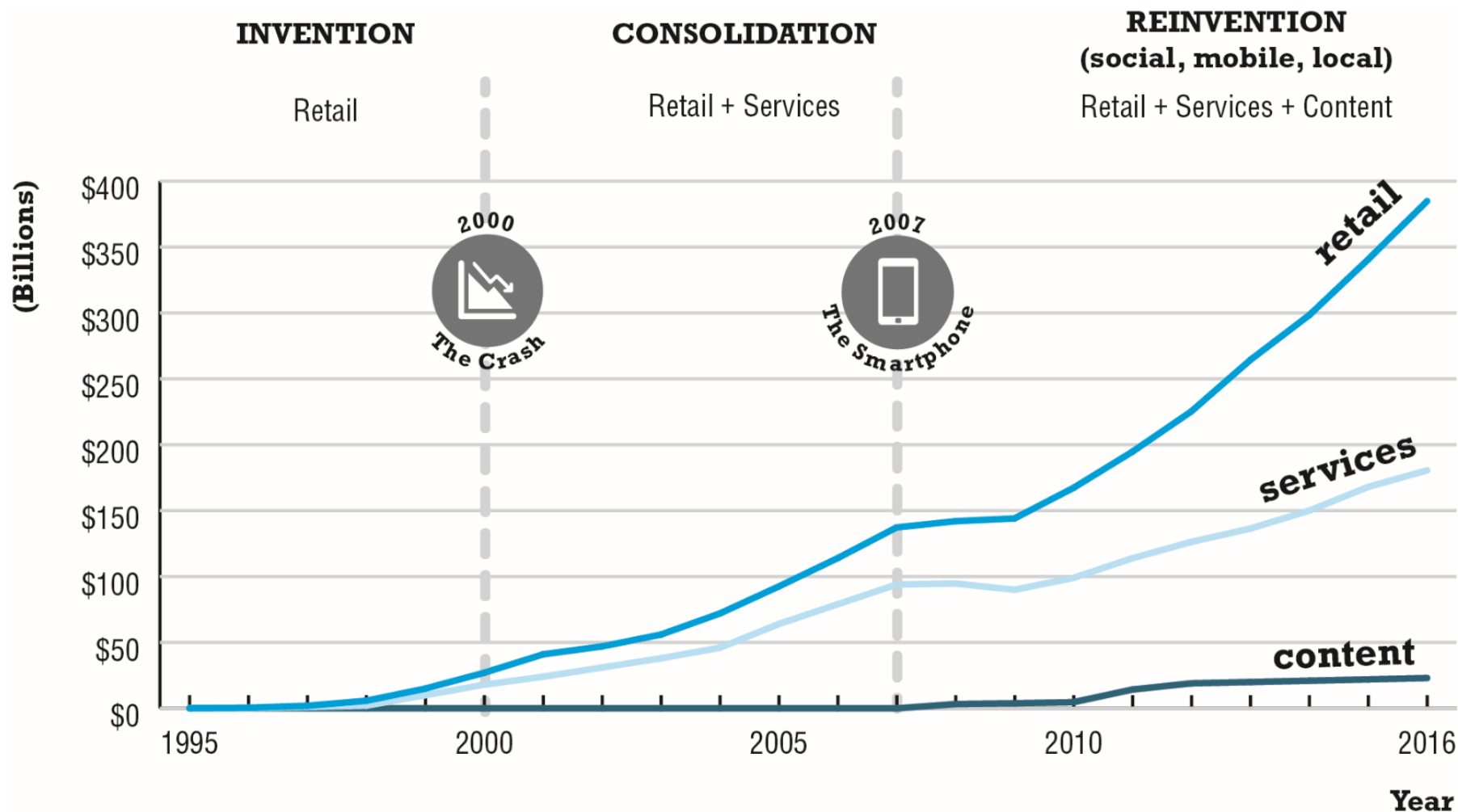
- Emphasis on **business-driven** approach: large traditional firms learned how to use the Web to strengthen their market positions.
- Traditional large firms **expand presence**
- Start-up financing **shrinks**
- More **complex products and services** sold: such as travel and financial services.
- Growth of **search engine advertising**: targeted to user queries, rich media and video ads, and behavioral targeting of marketing messages based on ad networks and auction markets.
- Business **Web presences** expand: included websites, e-mail, display, and search engine campaigns; multiple websites for each product; and the building of some limited community feedback facilities.

E-commerce: A Brief History (4 of 4)

2007–Present: Reinvention

- ✓ e-commerce has been transformed by the rapid growth of:
 - **Web 2.0** (a set of applications and technologies that enable user-generated content, such as online social networks, blogs, video and photo sharing sites, and wikis),
 - widespread **adoption of mobile devices** such as smartphones and tablet computers,
 - the expansion of e-commerce to include **local goods and services**, and
 - the **emergence of an on-demand service economy** enabled by millions of apps on mobile devices and cloud computing.
- ✓ Entertainment content develops as source of revenues
- ✓ Transformation of marketing
 - increasing use of social networks, word-of-mouth, viral marketing, and much more powerful data repositories and analytic tools for truly personal marketing.

Periods in the Development of E-commerce



Digital Goods

- Goods that can be delivered over a digital network
- Cost of producing first unit is almost entire cost of product
- Costs of delivery over the Internet very low
- Marketing costs remain the same; pricing highly variable
- Industries with digital goods are undergoing revolutionary changes (publishers, record labels, etc.)

Assessing E-commerce (1 of 2)

- Stunning technological success
- Early years a mixed business success
 - Few early dot-coms have survived
 - Online sales growing rapidly
 - Thousands of firms have failed, and those few that have survived dominate the market.
 - The idea of thousands of suppliers competing on price has been replaced by a market dominated by giant firms.
 - Consumers use the Web as a powerful source of information about products they often actually purchase through other channels, such as at a traditional store.

Assessing E-commerce (1 of 2)

- Many early visions not fulfilled
 - Price dispersion: Prices are sometimes **lower online**, but the low prices are sometimes a function of entrepreneurs selling products below their costs. In some cases, **online prices are higher**, as consumers are willing to pay a small premium for the convenience of buying online.
 - The concept of **one world, one market, one price** has not occurred in reality as entrepreneurs discover new ways to differentiate their products and services.
 - Merchants have adjusted to the competitive Internet environment by engaging in “**hit-and-run pricing**” or changing prices every day or hour (using “**flash pricing**” or “**flash sales**”) so competitors never know what they are charging (neither do customers); by making their prices hard to discover and sowing confusion among consumers.

Assessing E-commerce (1 of 2)

- Many early visions not fulfilled
 - brands remain very important in e-commerce—consumers trust some firms more than others to deliver a high-quality product on time and they are willing to pay for it.
 - The “perfect competition” model of extreme market efficiency has not come to pass.
 - e-commerce has created many opportunities for middlemen to aggregate content, products, and services and thereby introduce themselves as the “new” intermediaries.

Assessing E-commerce (2 of 2)

- Other surprises

- **First-mover advantage** appears to have succeeded only for a very small group of companies, albeit some of them extremely well-known, such as Google, Facebook, Amazon, and others.
- **Fast-follower advantages**: firms with the right complement of financial, marketing, legal, and production assets needed to develop mature markets, and this has proved true for e-commerce as well.
- Start-up costs (not lower than traditional physical in some cases).
- Impact of **mobile platform**: understanding of personal behavior than even Google has achieved.
- Emergence of **on-demand e-commerce**: enables people to use their mobile devices to order up everything from taxis, to groceries, to laundry service.

Understanding E-commerce: Organizing Themes

- **Technology:**
 - Development and mastery of digital computing and communications technology
- **Business:**
 - New technologies present businesses with new ways of organizing production and transacting business
- **Society:**
 - Intellectual property, individual privacy, public welfare policy

Major Trends in E-commerce

- Business trends include:
 - All forms of e-commerce show very strong growth
- Technology trends include:
 - Mobile platform has made mobile e-commerce reality
- Societal trends include:
 - Increased online social interaction and sharing

The Internet and the Evolution of Corporate Computing

Computer Technology

Mainframe Computers

1950 – 1975



Minicomputers

1970 – 1980



Personal Computers

1980 – Present



Local Area Networks Client/Server Computing

1980 – Present



Enterprise-wide Computing

1990 – Present



Internet and Web Mobile Platform Cloud Computing

1995 – Present



Business Application



Transaction automation
Payroll
Accounts receivable



Business function automation
Marketing
Human resources
Design



Desktop automation
Word processing
Spreadsheets
Databases



Workgroup automation
Document sharing
Project management
Messaging, e-mail



Enterprise-wide automation
Resource planning systems
Integrated finance-manufacturing systems
Human resource planning



Industrial system automation
Supply chain management
Customer relationship management
Channel management systems
Web and cloud services

Academic Disciplines Concerned with Technology

- Technical
 - Computer science, management science, information systems
- Behavioral
 - Information systems research, economics, marketing, management, finance/accounting, sociology