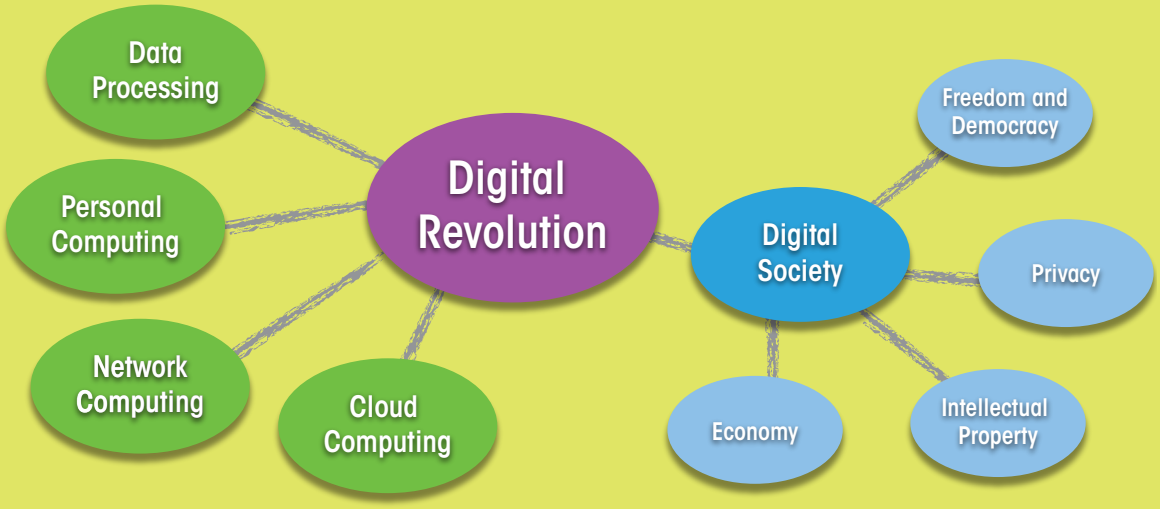

All Things Digital

SECTION **A**

WE LIVE IN THE INFORMATION AGE: a period in history when information is easy to access and affects many aspects of everyday life, from the economy to politics and social relationships. The importance of information is not new. It has always been a powerful tool. Scrolls treasured by monks during the Middle Ages, scientific knowledge collected during the Renaissance, and intelligence data collected during the Cold War were all critical in shaping world events. The Information Age is unique because of its underlying technology based on digital electronics. Section A offers an overview of the digital revolution that ushered in the Information Age.

TERMINOLOGY NOTE

The word *digital* comes from the root *digit*. In Latin, the word *digitus* means finger or toe. The modern use of the term *digital* is probably derived from the idea of counting on your fingers.

THE DIGITAL REVOLUTION

What is the digital revolution? The **digital revolution** is an ongoing process of social, political, and economic change brought about by digital technology, such as computers and the Internet.

Like the agricultural and industrial revolutions, the digital revolution offers advantages, but requires adaptations. Digital innovations challenge the status quo and require societies to make adjustments to traditions, lifestyles, and legislation.

The technology driving the digital revolution is based on digital electronics and the idea that electrical signals can represent data, such as numbers, words, pictures, and music. Without digital electronics, computers would be huge machines, priced far beyond the reach of individuals; your favorite form of entertainment would probably be foosball, and you'd be listening to bulky vacuum tube radios instead of carrying sleek iPods (Figure 1-1).

FIGURE 1-1

From Victrolas to stereos, and from boomboxes to iPods, music is only one aspect of life that's been affected by technology.

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What is the significance of digitization?

Digitization is the process of converting text, numbers, sound, photos, and video into data that can be processed by digital devices. The significant advantage of digitization is that things as diverse as books, movies, songs, conversations, documents, and photos can all be distilled down to a common set of signals that do not require separate devices.

Before digitization, a phone conversation required a telephone handset and dedicated phone lines. Viewing photos required a slide projector and screen. Reading required a paper book. Viewing movies required a film projector. Once digitized, however, conversations, photos, books, and movies can all be managed by a single device or transmitted over a single set of communication lines.

You can pull a photo down from a Web site, store it on your computer's hard disk, make a copy of it on a flash drive, send it to a friend as an e-mail attachment, add it to a report, print it, combine it with other photos to make a slide show, burn the slide show to a CD, and watch the slide show on your home theater system.

You can use a digitized photo in so many ways. In contrast, if you just have a photo print, you can make a copy of it with a photo copier, send it by snail mail, or frame it, but not much else. Digitization creates versatility.

The digital revolution has evolved through four phases, beginning with big, expensive, standalone computers, and progressing to today's digital world in which small, inexpensive digital devices are everywhere (Figure 1-2).

TRY IT!

According to Figure 1-2, AOL and CompuServe were popular when:

- ❍ data processing was the main digital technology
- ❍ most people had dial-up Internet access and used desktop computers
- ❍ smartphones and tablets were introduced
- ❍ people stopped using cloud computing

FIGURE 1-2

As the digital revolution progressed, technology changed, as did the way we use it.

Expired	Tired	Uninspired	Desired
Data processing	Personal computing	Network computing	Cloud computing
Big corporate and government computers	Desktop computers	Laptop computers	Smartphones and tablets
Custom applications	Standalone applications	Monolithic software suites	Handheld apps and cloud-based apps
CB radios	Dial-up Internet access	Cable and satellite Internet access	4G and Wi-Fi Internet access
ARPANET	AOL and CompuServe	The Web and virtual worlds	Social media
Arcade games	2-D action games	3-D multiplayer games	Touchscreen micro-games