

The Relationship Between Hardware and Software

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WHAT'S COVERED

Information systems can be incredibly complex, depending on their size and scope. In spite of varying levels of complexity, information systems consist of five components: hardware, software, data, people, and process. The first three components fit under the category of technology, and place the computer square at the center of modern information systems. In this tutorial, we will take a look at the core relationship between hardware and software.

Our discussion breaks down as follows:

1. Overview of Hardware and Software

Recall that information systems contain both hardware and software. **Hardware** is the part of an information system you can touch — the physical components of the technology. Computers, keyboards, disk drives, iPads, and flash drives are all examples of information systems hardware.

Software is the set of instructions that tells the hardware what to do. When programmers create software programs, what they are really doing is simply typing out lists of instructions that tell the hardware what to do. Software can come in many forms, including the operating system and application software. There are many types of application software as well. For example, word processing or spreadsheet applications are productivity software, and antivirus programs installed on a computer are an example of utility software.



TERMS TO KNOW

Hardware

The part of the information system that you can touch; the physical components of the technology.

Software

The set of instructions that tells the hardware what to do.

2. Relationship Between Hardware and Software

Essentially, computer software controls computer hardware. These two components are complementary and

cannot act independently of one another. In order for a computer to effectively manipulate data and produce useful output, its hardware and software must work together. Without software, computer hardware is useless. Conversely, computer software cannot be used without supporting hardware. Similarly, computer software has to first be loaded into the computer's hardware and then executed. There are several categories of software, with the two main categories being operating-system software, which makes the hardware usable, and application software, which does something useful. Examples of operating systems include Microsoft Windows on a personal computer and Google's Android on a mobile phone. Examples of application software are Microsoft Excel and Angry Birds.

IN CONTEXT

Consider the following analogy: an iPod is used to play recorded music in the form of an MP3. In order to listen to the recorded music, you need three things: an iPod, a speaker, and the MP3 file. In this analogy, both the iPod and the speaker are examples of hardware. The MP3 file, in this case, would represent software. Without the iPod or the speaker, you would not be able to listen to the MP3. By the same token, the iPod and the speaker would be worthless without the MP3 files to play.



SUMMARY

Information systems such as geographic information systems, search engines, and data warehouses rely on both **hardware and software** working in concert to achieve the goal of data manipulation. Computer software drives computer hardware by providing the instructions that tell the hardware what to do. Hardware will not function without software and software will not run without the appropriate hardware.

Source: Derived from Chapters 2 and 3 of "Information Systems for Business and Beyond" by David T. Bourgeois. Some sections removed for brevity.

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