

Before you proceed to the examples, we would like you to consider what an architecture is and what the attributes of a beautiful architecture might be. As you will see from the different definitions of architecture in this chapter, each discipline has its own definition, so we will first explore what is common among architectures in different disciplines and what problems one tries to solve with an architecture. Particularly, an architecture can help assure that the system satisfies the concerns of its stakeholders, and it can help deal with the complexity of conceiving, planning, building, and maintaining the system.

We then proceed to a definition of architecture and show how we can apply that definition to software architecture, since software is central to many of the later examples. Key to the definition is that an architecture consists of a set of structures designed to let the architects, builders, and other stakeholders see how their concerns are satisfied.

We end this chapter with a discussion of the attributes of beautiful architectures and cite a few examples. Central to beauty is conceptual integrity—that is, a set of abstractions and the rules for using them throughout the system as simply as possible.

In our discussion we will use “architecture” as a noun to denote a set of artifacts, including documentation such as blueprints and building specifications that describe the object to be built, wherein the object is viewed as a set of structures. The term is also used by some as a verb to describe the process of creating the artifacts, including the resulting work. As Jim Waldo and others have pointed out, however, there is no process that you can learn that guarantees you will produce a good system architecture, let alone a beautiful one (Waldo 2006), so we will focus more on artifacts than process.

**Architecture: “The art or science of building; esp. the art or practice of designing and building edifices for human use, taking both aesthetic and practical factors into account.”**

—The Shorter Oxford English Dictionary, *Fifth Edition*, 2002

In all disciplines, architecture provides a means for solving a common problem: assuring that a building, or bridge, or composition, or book, or computer, or network, or system has certain properties and behaviors when it has been built. Put another way, the architecture is both a plan for the system so that the result can have the desired properties and a description of the built system. Wikipedia says: “According to the earliest surviving work on the subject, Vitruvius’ ‘On Architecture,’ good building should have Beauty (Venustas), Firmness (Firmitas), and Utility (Utilitas); architecture can be said to be a balance and coordination among these three elements, with no one overpowering the others.”

**We speak of the “architecture” of a symphony, and call architecture, in its turn, “frozen music.”**

—Deryck Cooke, *The Language of Music*