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Chapter V

The Software Engineering Discipline

He who hurries cannot walk with dignity.

(Ancient Chinese saying)

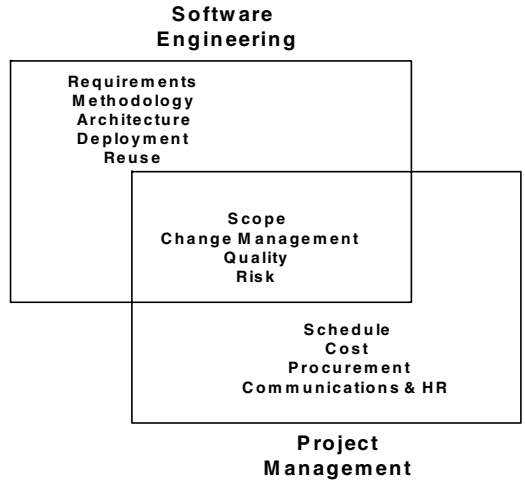
Software engineering is vital for the proper planning of IT projects, although it is not a formal part of project management. The software engineering embedded in the acquired products will significantly affect long-term project success factors, even for IT projects that primarily involve software acquisition and integration instead of software development,. In this chapter I review software engineering and its relation to IT project management.

Software Engineering vs. Project Management

The project management and software engineering disciplines overlap considerably, as is illustrated in Figure 5.1. The Institute of Electrical and Electronics Engineers (IEEE) software standard 1490-2003 provides for the adoption of PMI Standard (PMBOK).

The IT industry has no one methodology, architecture, or set of standards; however, in other industries, there are typically established codes, frameworks, patterns, methods, and tools that are almost always used. For example, the home building industry has county building codes, frameworks for house patterns (ranch, colonial, Tudor, contemporary, etc.), subdivision guidelines and limitations, standard methods, and tools of the trades involved. The IT industry has a number of rapidly changing and evolving

Figure 5.1. Software engineering vs. project management



standards, frameworks, architectures, tools, and methodologies from which to choose. Therefore, before the project is planned in terms of breaking down and assigning to resources the scope/requirements, these other issues need to be addressed. Many of the problems in project management can be traced back to problems in methodology, architecture, reuse (lack of), and standards.

The term *software engineering* was coined by Bauer (1972) who was a principal organizer of the 1968 NATO conference on that subject. His definition of *software engineering* was "the establishment and use of sound engineering principles in order to economically obtain software that is reliable and works on real machines." The IEEE definition is "the application of a systematic, disciplined, quantifiable approach to the development, operation, and maintenance of software (IEEE Std 610-1990). The modern Webopaedia definition follows:

Software engineering is the computer science discipline concerned with developing large computer applications. Software engineering covers not only the technical aspects of building software systems, but also management issues, such as directing programming teams, scheduling, and budgeting.

Software Development Life Cycle Methodology

According to Webster's dictionary, *methodology* is "a system of methods." My definition for *methodology* is "organized know-how." The most common and established