

Chapter XVIII

An International Perspective on Professional Software Engineering Credentials

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ABSTRACT

This chapter provides an international perspective on professional software engineering credentials. It distinguishes between professional licensing, certification, and other forms of credentials. It compares and contrasts several major approaches to professional credentials: broad-based certifications, national examinations, and job frameworks. Examples of credentials in each category are discussed in detail. The chapter also discusses efforts to develop international standards for these credentials. The chapter concludes with a brief description of the current landscape of professional software engineering credentials.

INTRODUCTION

Professional credentials can be classified into two broad categories. Credentials in the first category confer a governmentally sanctioned professional status that carries specific rights and privileges. For example, in the United States, a state awards licenses to individuals who wish to practice any of a wide variety of professions, including medi-

cine, engineering, accounting, and architecture. Practice in these professions is limited to those holding appropriate licenses. Practicing a profession without a license is subject to legal penalties, including fines and imprisonment. In the United Kingdom and Australia, chartered status for engineers, architects, and accountants carries similar rights, privileges, and restrictions. The requirements and processes associated with attain-

ing and maintaining licensed or chartered status are statutory. Enforcement of these requirements and processes is the responsibility of a government agency, which may possibly delegate this responsibility to a professional society.

Professional certifications constitute the second category of credentials. They are sought by practitioners who seek to demonstrate mastery of a particular body of knowledge. It is important to distinguish between broad-based certifications and product-specific certifications. Broad-based certifications are based on bodies of knowledge that cover an entire professional discipline or a subspecialty within such a discipline. These certifications are generally awarded by professional societies. Examples of broad-based certifications include specialty certifications in medicine or law and financial certifications. In the computing domain, broad-based certifications are available for software engineers and security experts. By contrast, product-specific certifications are based on a specific product or product line, such as a medical device or an operating system. The manufacturers of the products or product lines usually award certifications tied to their products.

In general, candidates applying for a broad-based certification must meet specific education and experience requirements. A candidate's familiarity with a body of knowledge is generally assessed by examination, although some certification programs use peer review to assess knowledge and/or professional experience. Most certification programs require that a certificate holder demonstrate professional activity and continuing education in order to maintain certification. Broad-based certification programs are governed by national and international standards. Product-specific certifications generally use examinations to assess candidates' familiarity with the product and its use, and maintenance requirements are less commonly found.

Another approach to professional credentials is based on job frameworks, which organize the tasks performed by professionals in a domain into

a multidimensional structure. The dimensions represent the skills performed by professionals and the ways and levels at which those skills are utilized in a specific job category. Several job frameworks for the information and communication technology (ICT) domain have recently been developed in Europe.

This chapter will describe the spectrum of software engineering professional credentials. It will give an overview of the historical and international background of software engineering licensing and certification. It will summarize and place in context some current licensing and certification efforts that relate to software engineering professionals. Examples presented will include:

- The IEEE Computer Society's Certified Software Development Professional (CSDP) certification
- The Australian Computer Society's approach to granting chartered status to software engineers
- The approaches to software engineering licensure taken by Texas and some Canadian provinces
- The Japanese program of information technology professional examinations
- The iSQI approach to certifying software testing professionals
- The UK's SFIA job framework and its relationship to other European job frameworks

The chapter will also discuss the ongoing effort to develop an ISO/IEC standard for programs certifying software engineering professionals.

PROFESSIONALISM AND LICENSURE

Until the nineteenth century, professional status was limited to clergy, medical doctors, and lawyers. Professional organizations controlled status

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