The Nature of a Profession

Chapter-2

CS449-Professioal Issues in Information Technology

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Chapter Outcome

After studying this chapter, you should understand:

- *the legal status of professional bodies;*
- *the ideas of reservation of title and reservation of function;*
- *the current status of the engineering profession in the UK, the USA and internationally;*
- *the arguments for and against the licensing of information systems engineers or software Engineers.*

Profession

- Profession is a noun describing a job type, usually reserved for a recognized specific career, i.e. Doctors, Lawyers, Engineers, Social Workers, Military Officers. It conveys expertise and/or education.
- Difference between Occupation & Profession?

Designing a building would be called a profession, whereas, constructing a building is an occupation. A profession needs extensive training and specialized knowledge to do the job properly.

Profession

Words like *profession* and *professional* are used in many different ways.

A professional Cricketer is one who makes his living from playing the game.

Professional employees are employees of a certain status, who are expected, within limits, to put the interests of the organization they work for above their own convenience.

To describe someone as a 'real professional' implies that they can be relied on to carry out their work competently and conscientiously regardless of the circumstances.

Profession

A professional piece of work means a piece of work that meets established standards of quality.

However, the terms can also have negative overtones – a professional foul is one committed deliberately by a professional footballer who calculates that, on the balance of probabilities, it will work out in his favor.

The term '*pro*' is used as a colloquial(used in common conversation) shorthand for a professional.

Profession…

- Substantial education and training are required in order to practice the profession;
- The members of the profession themselves decide the nature of this training and, more generally, control entry to the profession;
- The profession is organized into one or more professional bodies;
- The profession lays down standards of conduct with which its members must comply and, where necessary, enforce these through disciplinary procedures.

Professional Bodies

As we have already stated, a profession is typically organized into one or more professional bodies. *What is a professional body?*

A professional body usually starts by a group of people coming together because of a shared interest in a particular type of activity.

The BCS was set up in 1957 by a group of people working in the new and expanding field of computers, who wanted the opportunity to exchange ideas.

Professional Bodies....

The Institution of Electrical Engineers, the other main body in the UK that includes information systems engineers among its members, is older.

It was set up in 1871 by people with an interest in the developing field of electrical engineering that could not be met by the existing engineering institutions.

Professional Bodies….

A professional body may also be started by people engaged in the same type of activity, who want to protect their business against others who may be trying to enter it without having the proper knowledge or who may be practicing it dishonestly.

After maturity the professional body develops the following most important functions:

- Establishing a code of conduct to regulate the way members of the body behave in their professional lives and a disciplinary procedure to discipline members who breach this code;

Professional Bodies….

- Establishing mechanisms for disseminating knowledge of good practice and new developments to its members, typically through publications conferences and through the use of the worldwide web(www);
- Setting standards of education and experience that must be met by people wishing to become members of the body;
- Advising government and regulatory bodies about matters within its area of expertise.

Engineering Council

- The objectives of the Engineering Council are to advance education in, and to promote the science and practice of engineering (including relevant technology) for the public benefit
- To promote industry and commerce in that country and elsewhere.

In order to do this, it does the following:

Engineering Council...

- Sets standards of education, experience and competence for initial registration as a qualified engineer and for continuing professional development
- Maintains registers of Chartered Engineers, Incorporated Engineers, and Engineering Technicians;
- Licenses appropriate professional bodies (‘licensed members’) to admit their members to these registers;

Engineering Council...

- Maintains registers of accredited or approved programs of education;
- Acts as the representative of that country to relevant international bodies;
- Receives and responds to requests for assistance and advice from the government.

Engineering Council...

The Engineering Council gives the following definition of the three sections of the register:

1. ***Chartered Engineers*** are characterized by their ability to develop appropriate solutions to engineering problems, using new or existing technologies, through innovation, creativity and change.

Engineering Council...

They might develop and apply:

- New technologies,
- Promote advanced designs & design methods,
- Introduce new and more efficient production techniques, marketing and construction concepts,
- Pioneer new engineering services and management methods.

Engineering Council...

2. Incorporated Engineers (IEng)

They are characterized by their ability to act as exponents of today's technology through creativity and innovation.

To this end, they maintain & manage applications of current and developing technology, and may undertake engineering design, development, manufacture and operation.

Engineering Council...

3. Professional Engineering Technicians are involved in applying proven techniques and procedures to the solution of practical engineering problems.

They carry supervisory or technical responsibility, and are competent to exercise creative aptitudes and skills within defined fields of technology.

Engineering Council...

Professional Engineering Technicians contribute to the:

- Design
- Development
- Manufacture
- Commissioning
- Operation or maintenance of products, equipment, processes or services.

Professional Engineering Technicians are required to apply safe systems of work.

Washington Accord

The Washington Accord, signed in 1989, is an international agreement among bodies responsible for accrediting Engineering degree programs. The original member countries included were *Australia*, *Canada*, *Ireland*, *New Zealand*, the *UK* and the *USA*.

- They each used to accredit the academic component of an Engineer's education and training were similar enough for each of them to recognize and accept such qualifications (essentially accredited degrees) gained in any of the other countries.
- The agreement is fairly limited, it commits the signatories only to the mutual recognition of undergraduate degrees accredited at the level of professional Engineer.

Washington Accord..

- It does not imply any mutual recognition of professional qualifications such as registered or chartered Engineer status.
- It recommends that graduates of programs accredited by any of the signatory bodies be recognized by the other bodies as having met the academic requirements for entry to the practice of Engineering.

It is important to realize that the Washington Accord applies only to the academic requirements for qualifying as a professional Engineer.

Washington Accord……

- Signatories Have full rights of participation in the Accord;
- Qualifications accredited or recognized by other signatories are recognized by each signatory as being substantially equivalent to accredited or recognized qualifications within its own jurisdiction.

Washington Accord……

Organizations holding provisional status:

- Have been identified as having qualification accreditation or recognition procedures that are potentially suitable for the purposes of the Accord;
- Those organizations are further developing those procedures with the goal of achieving signatory status in due course;
- Qualifications accredited or recognized by organizations holding provisional status are not recognized by the signatories

Washington Accord……

- India became the permanent signatory to Washington Accord on June 13, 2014 in a meeting held at International Energy Alliance(IEA) , New Zealand.

- Pakistan has recently been made a full member of this accord.

Reservation of Title and Function

The use of the name of the profession may be restricted to those people who are appropriately qualified. A restriction of this sort is called *reservation of title*.

The law may state that certain activities are restricted to people with appropriate qualifications. This is called *reservation of function*.

- Is it illegal if you call yourself a pilot?
- Is it illegal if you fly a plane?
- Is it illegal to call yourself a policeman?

Reservation of Title and Function….

- In some cases, it is not illegal to claim yourself to belong to some profession unless it is to commit fraud.

Engineering

There are two constraints that apply to all such activities and which can be regarded as characteristic of Engineering:

1. Engineering involves designing and building things that must work properly, that is, must meet a set of predetermined requirements concerning their functionality, their performance, and their reliability;

2. The process of designing and building the object must be completed within specified constraints of time and budget.

Engineering….

It is illegal for a company to use the word ‘Engineering’ in its name unless:

- It employs at least one registered Engineer;

Academic programs including the term Engineering in their title

- Must be taught mostly by registered Engineers;
- It is illegal to carry out Engineering work except under the supervision of a registered Engineer.

COMPULSORY REGISTRATION OF SOFTWARE ENGINEERS

Why all this discussion about whether Software can be called an 'Engineering'?

- Therac-25 in the USA & the London Ambulance System disaster in the UK are only two of many examples that show how the professional incompetence of software developers can lead to avoidable deaths.
- Developers lacked professional qualifications, among other things.

COMPULSORY REGISTRATION OF SOFTWARE ENGINEERS….

But, does someone developing a Facebook page really need to be penalized if he/she does not have a formal qualification in computer science?

It would be more realistic and more defensible to require that the design and implementation of all '*critical*' systems should be under the control of a registered software Engineer.

(*By a critical system, we mean a system whose failure to operate correctly could result in physical injury or loss of life, or catastrophic economic damage*)

COMPULSORY REGISTRATION OF SOFTWARE ENGINEERS....

One difficulty is that the boundary between critical and non-critical systems is not always well defined.

While it is clear that an air traffic control system should be considered critical, because a failure can result directly in loss of life

Should we consider a medical records system to be critical, because the loss of information concerning, say, a patient's allergy to penicillin could in some circumstances lead to the death of the patient?

COMPULSORY REGISTRATION OF SOFTWARE ENGINEERS….

A second difficulty is that many Chartered Engineers who are qualified in software Engineering have not studied the rather specialized techniques needed for working on critical systems.

Nor, for the jobs they are doing, is it necessary that they should.

In the UK context, compulsory reservation of function for software Engineers, even for critical systems work, is unlikely to be realistic except as part of a move towards reservation of function for Engineers.

Summary

- Professional bodies
- Reservation of title and function
- Software development as Engineering
- The status of Engineers
- International recognition of Engineering qualifications
- Compulsory registration of software Engineers