Is Software Engineering a Profession?

There is a debate going on right now. Is software engineering a profession?

To answer that, we have to answer some questions.

Some Questions

- Pause the video and spend some time thinking about these four questions:
  - What are some professions?
  - What criteria are used to determine whether something is a profession?
  - What aspects of software engineering make it like a profession?
  - What aspects of software engineering are not like a profession?

Here are some things to think about when deciding whether something is a profession.

We'll start by just thinking of some professions.

What do these professions have in common? What is a good indicator that something is a profession?

Then, let's apply these criteria to software engineering to see whether it is a profession.

So stop the video at this point and think about these four questions. You might want to write your answers down. If you want to discuss this topic, feel free to post to the office hours forum.

What Are Some Professions?

Lawyer   Doctor   Engineer   Teacher

Plumber   Truck Driver   PGA Golfer   Musician

Of course, almost everyone would consider medical doctors or lawyers or engineers to be professionals. Because of their credentials, we can feel safe in putting our trust in their hands. They must pass rigorous tests to get a license to practice their professions. Same goes for teachers, plumbers and truck drivers. My wife taught first grade in the public school. She needed a professional license in order to do that. I teach at Johns Hopkins graduate school. I don't need a license to do that. By the licensing criterion, my wife is the professional and I am not.

Most professions require that members have acquired a body of skill, either through trade school or apprenticeship. This skill is needed in order to pass the licensing exams. Most professions require their members to keep their skills current by taking continuing education classes.

Why is PGA Golfer in the list? One of the main differences between professional athletes (like baseball players, basketball players, and soccer players) is that professionals get paid and amateurs don't.

Many years ago, I played drums in a dance band. I earned money doing it. It took some skill but there were no licensing requirements to do it. Given the criterion of getting paid, I called myself a professional musician. In fact, all I was was a paid amateur. Other musicians who were members of the musician's union were considered sort of professional, though.

Professional Criteria

- What criteria are used to determine whether something is a profession?
  - License obtained by passing a test
  - Skill obtained through study and training
  - Skill updated through continuing education
  - Paid (vs. unpaid amateur)
- Professional society membership
  - Code of ethics

As we have discussed, these are some of the criteria that can be used to determine whether something is a profession.

We could also note that many professionals belong to one or more professional societies, frequently by invitation. Think FACS (Fellow of the American College of Surgeons) membership for doctors. Most of these professional societies have established codes of ethics by which members must abide.

Software Engineering Seems Like a Profession

- Software engineers must have skills obtained usually through academic training.
- To be successful, a software engineer must continually update the skills (but no requirement)
- Software engineers are (hopefully) paid

All in all, many aspects of software engineering seem like it is a profession.

Software engineers must have a set of skills that must usually be obtained through academic training. These skills must be continually updated. (Not required, but necessary to keep up with a changing industry).

Software engineers are not amateurs and do get paid.

Licensing and Codes of Ethics

- Professional Software Engineer exam and license
- Certification programs from private industry
- Customers may require that some people working on a given contract have obtained certain certifications

Currently there are several efforts under way to create a professional software engineer exam and license. Doing a quick internet search of "professional software engineer" will lead to information on a lot of this effort.

Many companies sponsor certification programs, usually on tools or processes sold by those companies.

Sometimes customers require that certain people working on a given contract have obtained certain certifications as a form of quality assurance.

So, is software engineering a profession? I don't think we can say that yet, but we are making progress in that direction.

Software Engineering Professional Organizations

- Association for Computing Machinery (ACM)
  - www.acm.org
- Institute of Electrical and Electronics Engineers – Computer Society (IEEE-CS)
  - www.computer.org

There are two professional organizations that we software engineers can join.

The Association for Computing Machinery (ACM) is the oldest professional organization for software people (despite its name, its principal focus is software).

The other organization is a special interest society within the IEEE. The computer society is by far the largest society within the IEEE.

To a large degree the two organizations overlap. Most professionals belong to both organizations. The dues are about a hundred dollars a year for each organization.

Students can join these societies at greatly reduced cost. Go to their websites for more information on student memberships.

Code of Ethics

- ACM Code of Ethics and Professional Conduct
  - https://www.acm.org/code-of-ethics

One thing the two organizations did jointly was to develop a code of ethics and professional conduct. The ACM and IEEE versions are similar. Here is the link to the ACM version, which has been updated more recently. When you join one of these organizations, you are in effect agreeing to abide by the code of ethics and professional conduct. You should read this over before taking the quiz at the end of this module.

End of Module

- You should now be able to:
  - Define Software Engineering.
  - Explain why an engineering discipline is needed for software development today.
  - Discuss some of the problems that result if you don't apply engineering to the development of software.
  - Recognize the goals and principles of Software Engineering.
  - Argue why Software Engineering is, and is not, a Profession.

We are now at the end of this module. Here is what you should be able to do:

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- Explain why an engineering discipline is needed for software development today.
- Discuss some of the problems that result if you don't apply engineering to the development of software.
- Recognize the goals and principles of Software Engineering.
- Argue why Software Engineering is, and is not, a Profession.

Don't forget to take the quiz. You have two chances to take each of the quizzes in this

course. If you do take a quiz twice, the two scores will be averaged together.