Professional Practices in Software Development (PPSI)

"The Computing Profession"

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Profession

"A paid occupation, especially one that involves prolonged training and a formal qualification"

Profession

- A formal education is one where you would go to a college or university for an actual degree.

- An informal education is simply learning a trade from someone else. It's possible to have a formal education and an informal education.

- The formal education is what most employers would prefer to see because it is easier to prove. Having a degree in a specific field will mean that you have certain knowledge that will translate into a better paying job and the company that's employing you getting a qualified person for the job.

Profession

- An informal education is what many people end up having. You work under someone who has a degree or has been doing it for enough years to be knowledgeable about the subject.

- Many car mechanics and other "trade" skills usually have an informal education as to what they're doing.

- Informal education can also be referred to as life experience. After going through life for so many years, you'll naturally acquire some knowledge about different things that you may not even learn after going through a formal education.

Fundamental characteristics of a profession

- **Great responsibility**
  - Professionals deal in matters of <mark>vital importance</mark> to their <mark>clients</mark> and are therefore entrusted with grave responsibilities and obligations.
  - Given these essential obligations, professional work typically involves circumstances where carelessness, inadequate skill, or breach of ethics would be significantly damaging to the client and/or his fortunes.

Fundamental characteristics of a profession

- **Accountability**
  - Professionals <mark>hold themselves</mark> ultimately <mark>accountable</mark> for the quality of their work with the client.
  - The profession may or may not have mechanisms in place to reinforce and ensure adherence to this principle among its members.

Fundamental characteristics of a profession

- **Based on specialized, theoretical knowledge**
  - Professionals render specialized services based on theory, knowledge, and skills that are characteristic to their profession and generally beyond the understanding or capability of those outside of the profession.
  - Sometimes, this specialization will extend to access to the tools and technologies used in the profession (e.g. medical equipment).

Fundamental characteristics of a profession

- **Institutional preparation**
  - Professions typically require a significant period of hands-on, practical experience in the protected company of senior members before candidates are recognized as professionals.
  - After this provisional period, ongoing education toward professional development is compulsory.

Fundamental characteristics of a profession

- **Ethical constraints**
  - Due to the other characteristics on this list, there is a clear requirement for ethical constraints in the professions.
  - Professionals are bound to a code of conduct or ethics specific to the distinct profession.
  - Professionals also aim toward a general body of core values, which are centered upon the client's benefit and best interests.

Fundamental characteristics of a profession

- **Merit-based**
  - In a profession, members achieve employment and success based on merit rather than on corrupted ideas such as social principle, mandated support, or extortion.
  - Therefore, a professional is one who must attract clients and profits due to the merits of his work.
  - In the absence of this characteristic, issues of responsibility, accountability, and ethical constraints become irrelevant, negating any otherwise-professional characteristics.

10 things that define a true professional

- Put customer satisfaction first
- Make expertise your specialty
- Do more than expected
- Do what you say and say what you can do
- Communicate effectively
- Follow exceptional guiding principles
- Praise your peers not yourself
- Share your knowledge
- Say thank you
- Keep a smile on your face and the right attitude in your heart

Structure of computing profession

- The computing profession has a ==two tier structure==.

- At the first level, there are the ==institutions==, that is, the ==chartered professional bodies==, each of which covers a single or several closely related computing disciplines. Examples are ==PIEAS, NUST, UET== etc.

Structure of computing profession

- The second level body in computing is the computing council, a chartered body which recognizes certain computing institutions as its nominated bodies.

- By recognizing a computing institution means that Computing council is satisfied with its standard of education.

Structure of computing profession

- Computing council acts as an umbrella body and represents the interests of the computing profession as a whole.

- National Computing Education Accreditation Council (NCEAC) is a professional body and constitutional federal institution for accreditation of computing education and regulation of computing profession in Pakistan.

Structure of computing profession

- NCEAC is recognized accreditator of computing programs in Pakistan.

- It ensures the quality of education students received in universities and institutions.

- It stimulates innovation in applied sciences, computing, Engineering and technology education.

Ethics

- Ethics is the study of right and wrong in relation to human actions. It includes
  - *Meta-ethics:* study of general principles from which ethical systems can be built.
  - *Moral theory:* ethical systems, consisting of the criteria to decide whether individual actions are right and wrong.
  - *Practical ethics:* application of ethical systems to the analysis of particular situations.

What is Professional Ethics

- One's conduct of behavior and practice when carrying out professional work, e.g., consulting, researching, teaching.

- The principles and standards that guide members of a particular profession in their interactions with internal & external stakeholders.

Professional Ethics

- „Professional Ethics must take into accounts:
  - Relations between professionals and clients
  - Relation between profession and society
  - Relations among professionals
  - Relations between employee and employer

Why professional ethics?

- Awareness of professional ethics is gaining importance with time.

- **Decision making** process in the work place is a complex phenomena.

- The professional ethics provide a way of **simplifying** that decision making process.

Ethical Issues in Computer Science

- As software becomes pervasive in our daily lives, its values from a purely human perspective are brought to light.

- Ethical conduct is one such human value.

- By participating in a software development process, computer scientists can influence the final product, namely the software itself, in different ways including those that may be contrary to public interest.

- In other words, they could engage in an unethical behavior, intentionally or un-intentionally.

Ethical Issues in Computer Science

- This could lead to personal harm, and potentially result in loss of confidence in software and loss of trust in organizations that own them.

- This can adversely affect the acceptance of software as a useful product, question the credibility of computer science as a profession.

- Computer Science professionals must concern themselves primarily with the health, safety and welfare of those who are affected by their work.

Professional code of conduct

- One of main characteristic of profession is that the <mark>professional body</mark> establishes and <mark>enforces a code of conduct on its members</mark>.

- As far as computing is concerned, most code of conducts established by ACM and IEEE undergo major revisions with the passage of time.

- All previous code of conducts are recently replaced by "<mark>Software Engineering Code of Ethics and Professional Practice</mark>" developed jointly by the ACM and IEEE Computer society.

Professional code of conduct

- It outlines 8 principles of computing ethics: The obligation of the computing professional to the
  - general public
  - the client and employer
  - the product
  - the profession
  - Colleagues
  - the engineer himself or herself
  - the ethical management of software engineering projects.

Ten Commandments of Computer ethics

- The Ten Commandments of Computer Ethics were created in 1992 by the Computer Ethics Institute.

  - Not use a computer to harm other people. This is the foundation for computer ethics.

  - Not interfere with other people's computer work. Such as sending numerous thoughtless e-mails to larger issues like purposely sending computer viruses.

  - Not snoop around in other people's computer files. Don't go looking through other people's computer files unless given permission.

Ten Commandments of Computer ethics

– Not use a computer to steal.

– Not use a computer to bear false witness. Don't spread rumors or change your email address so that the receiver of an email believes that it came from someone other than yourself.

– Not copy or use proprietary software for which you have not paid. Once you buy a software system, music CD or DVD you should not make copies of that information and distribute it to your friends.

Ten Commandments of Computer ethics

– Not use other people's computer resources without authorization or proper compensation. This means do not surf the internet or print off large amounts of paper for personal use during work hours.

– Not appropriate other people's intellectual output. Don't upload information and take credit for it such as music, images and text.

Ten Commandments of Computer ethics

– Think about the social consequences of the program you are writing or the system you are designing.

– Use a computer in ways that ensure consideration and respect for your fellow humans. Just because you can't always see someone face to face doesn't give you the right to offer any less respect then you would offer in a personal encounter.

Applying codes of conduct (Case Studies)

- This section provides some examples based on real situations regarding professional practices in software engineering.
  - Sales proposals
  - Integrity and professional status.
  - Public health and safety
  - Conflicts of interest