Chapter 9
Professional Ethics

COMP422 Ethics and Professional Issues in Computing
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Based on
Ethics for the Information Age (5th Ed.)
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Chapter Overview

- Introduction
- Is software engineering a profession?
- Software engineering code of ethics
- Analysis of the code
- Case studies
- Whistleblowing

9.1 Introduction

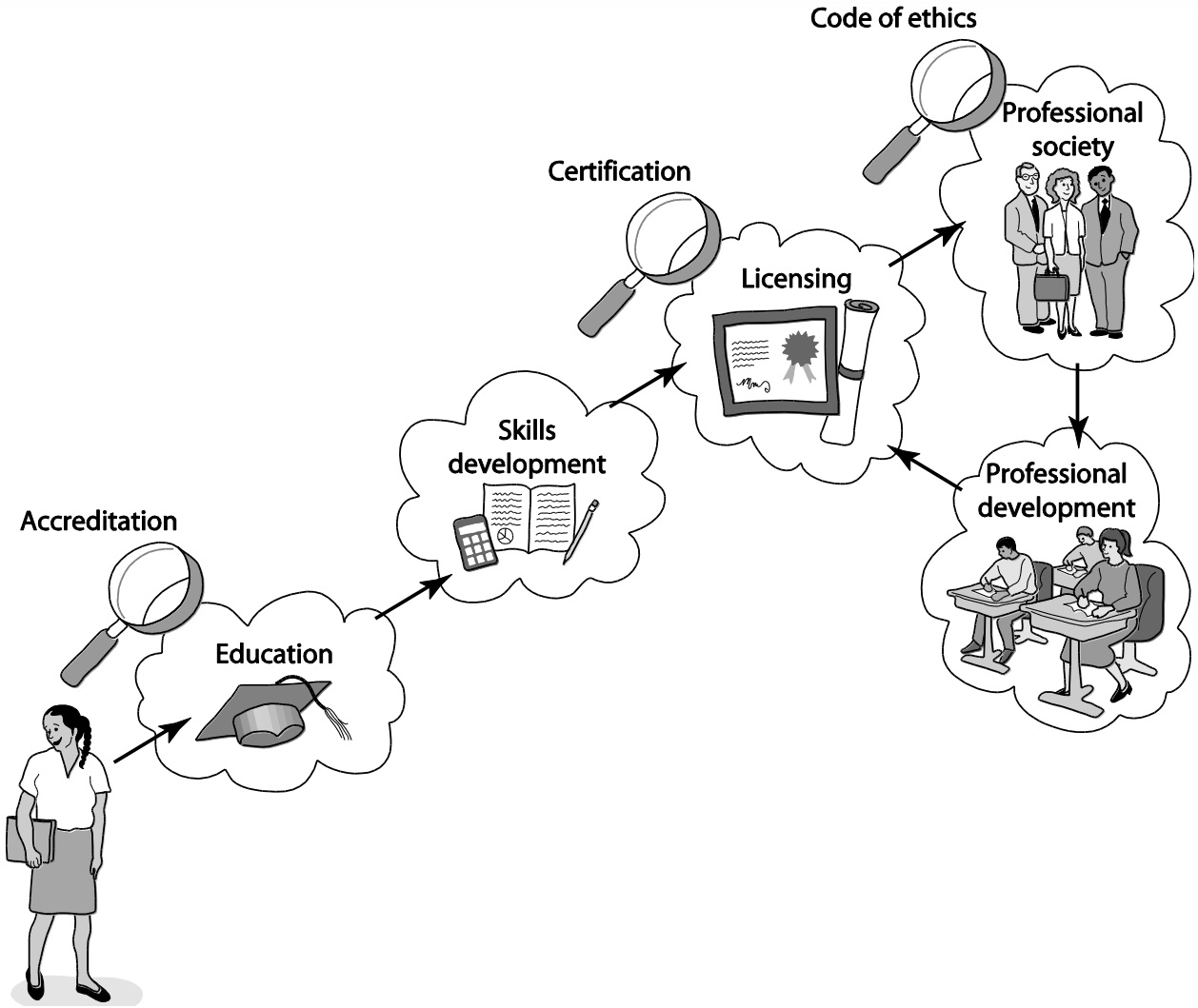
- Informally, profession a vocation requiring…
  - High level of education
  - Practical experience
- We pay professionals well
  - Doctors
  - Lawyers
- We trust professionals to…
  - Correctly ascertain and treat problems
  - Take actions for the good of their clients

9.2 Are Computer Experts Professionals?

Characteristics of a Profession

- Initial professional education
- Accreditation
- Skills development
- Certification
- Licensing
- Professional development
- Code of ethics
- Professional society

Attributes of a Mature Profession



Certified Public Accountants

- Bachelor's degree
  - 150+ semester hours
  - 24+ hours of accounting-related classes
- Two years' experience working under supervision of a CPA
- CPA exam
- To retain certification
  - Continuing education
  - Follow code of ethics

Computer-Related Careers

- Certification and licensing not required
- College degree not required
- Apprenticeship not required
- Membership in professional society optional
- No specific requirements for continuing education
- Most computer programmers, system analysts, etc. are part of teams
- ***Ability to harm public can be similar to members of mature professions***

9.3 Software Engineering Code of Ethics (PP. 408-416)

- The "Software Engineering Code of Ethics and Professional Practice" was developed and approved by the two largest organizations supporting the computing field – the "IEEE Computer Society" (IEEE-CS) and the "Association for Computing Machinery" (ACM)
- For the web version of "Software Engineering Code of Ethics and Professional Practice", click here.

Preamble of Code

- Software engineers have opportunities to do good or do harm
- Software engineers ought to be committed to doing good
- Eight principles identify key ethical relationships and obligations within these relationship
- Code should be seen as a whole, not a collection of parts
- Concern for the public interest is paramount

Eight Principles Identify Morally Responsible Relationships

- Public
- Client and employer
- Product
- Judgment
- Management
- Profession
- Colleagues
- Self

Act Consistently with Public Interest

1.01 “Accept full responsibility for own work”

1.02 Balance competing interests

1.03 Approve software only if it is safe

1.04 Disclose actual/potential dangers

1.05 “Cooperate in efforts to address” public concerns

1.06 “Be fair and avoid deception in all statements”

1.07 Consider factors that diminish access to software

1.08 “Volunteer professional skills to good causes”

Clause 1.03
Approve Software Only If It Is Safe

Act in Best Interest of Client, Employer

2.01 Act within areas of competence

2.02 Don't use software obtained illegally

2.03 Only use property in authorized ways

2.04 Ensure documents are approved

2.05 Respect confidentiality

2.06 Promptly report problems with project

2.07 Report issues of social concern

2.08 Refuse outside work detrimental to job

2.09 Put employer's/client's interests first, unless overriding moral concern

Clause 2.02
Don’t Use Software Obtained Illegally

Ensure Products Meet Highest Standards

3.01 Aim for “high quality, acceptable cost and a reasonable schedule,” making trade-offs clear

3.02 “Ensure proper and achievable goals”

3.03 Face up to “ethical, economic, cultural, legal and environmental” issues

3.04 Ensure you are qualified for proposed work

3.05 Use appropriate project methodologies

3.06 Follow the most appropriate professional standards

3.07 “Strive to fully understand the specifications”

3.08 Ensure the specifications are correct and approved

Clause 3.02
“Ensure Proper and Achievable Goals”

Ensure Products Meet Highest Standards

3.09 “Ensure realistic quantitative estimates of cost, scheduling, personnel, quality and outcomes”

3.10 “Ensure adequate testing, debugging, and review of software and related documents”

3.11 “Ensure adequate documentation”

3.12 Develop software and documents that respect privacy of those affected by software

3.13 Use only accurate data appropriately acquired

3.14 Maintain data integrity

3.15 Use same standards for software maintenance as software development

Maintain Integrity in Professional Judgment

4.01 “Temper all technical judgments by the need to support and maintain human values”

4.02 Understand and agree with documents before endorsing them

4.03 Remain objective when evaluating software or related documents

4.04 Do not engage in deceptive financial practices

4.05 Disclose conflicts of interest

4.06 Do not participate in decisions in which you, your employer, or your client has a potential conflict of interest

Promote Effective Project Management

5.01 Ensure good project management procedures

5.02 Ensure software engineers know standards

5.03 Ensure software engineers know policies and procedures for protecting confidential information

5.04 Take employees' abilities into account before assigning work

5.05 Ensure reasonable estimates are made

5.06 Give full and accurate information to potential employees

Promote Effective Project Management

5.07 Pay employees fairly

5.08 Do not unjustly prevent a qualified person from taking a job

5.09 Work out fair intellectual property agreements

5.10 Provide employees charged with misconduct due process

5.11 Do not ask someone to do anything violating the Code

5.12 “Do not punish anyone for expressing ethical concerns about a project”

Advance the Profession

6.01 Help create an environment supporting ethical conduct

6.02 “Promote public knowledge of software engineering”

6.03 Participate in professional activities

6.04 Support others who are trying to follow this Code

6.05 Do not promote self-interest at expense of profession, client, or employer

6.06 Obey all laws unless there is an overriding public interest

6.07 Do not deceive others regarding the characteristics of software

Clause 6.01 Help Create An Environment Supporting Ethical Conduct

Advance the Profession

6.08 Take responsibility for finding, correcting, and reporting errors in software and documentation

6.09 Ensure others know you are committed to the Code and what that means

6.10 Do not associate with businesses and organizations that are in conflict with Code

6.11 Understand violating the Code is inconsistent with being a professional

6.12 Share concerns about Code violations with the people involved

6.13 “Blow the whistle” when no alternative to reporting significant Code violations

Be Fair to and Supportive of Colleagues

7.01 “Encourage colleagues to adhere to this Code”

7.02 “Assist colleagues in professional development”

7.03 Give others the credit they deserve

7.04 Be objective when reviewing the work of others

7.05 Give colleagues a fair hearing

7.06 Help colleagues remain aware of work practices

7.07 Do not unfairly interfere with another’s career, but protect the public interest

7.08 Bring in experts for situations outside your own area of competence.

Participate in Lifelong Learning

8.01 Stay current with developments in field

8.02 Improve ability to create high quality software

8.03 Improve ability to produce high quality documentation

8.04 Improve understanding of software and documentation used in work

8.05 Improve knowledge of relevant standards

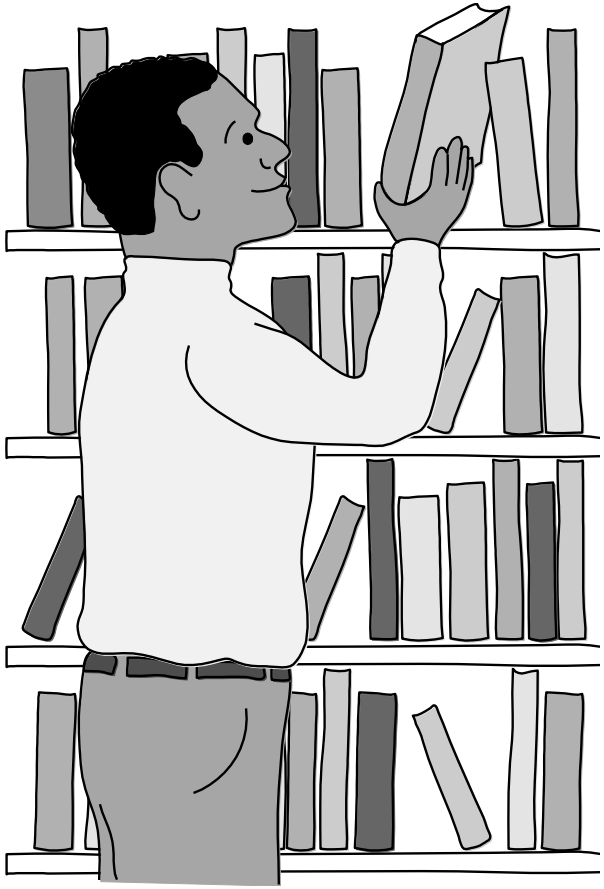
8.06 Improve knowledge of this Code and its application

8.07 Do not treat others unfairly because of prejudices

8.08 Do not influence others to break the Code

8.09 “Recognize that personal violations of this Code are inconsistent with being a professional software engineer”

Clause 8.02 Improve Ability to Create High Quality Software



9.4 Analysis of the Code

Analysis of Preamble

- No mechanical process for determining if an action is right or wrong
- Should not take an overly legalistic view of the Code
  - If Code doesn't forbid something, that doesn't mean it is morally acceptable
  - Judgment required
- Code reflects principles drawn from multiple ethical theories

Origin of Virtue Ethics

- Aristotle
  - Happiness results from living a life of virtue
  - Intellectual virtue: developed through education
  - Moral virtue: developed by repeating appropriate acts
  - Deriving pleasure from a virtuous act is a sign that the virtue has been acquired
- Some virtues: Benevolence, courage, fairness, generosity, honesty, loyalty, patience, tolerance (see P. 417 for more examples)
- A person of strong moral character
  - possesses many virtues
  - knows right thing to do in each situation

Aristotle Believed Happiness Derives from Living a Life of Virtue

Strengths of Virtue Ethics

- Provides a motivation for good behavior
- Provides a solution to the problem of impartiality
  - Some virtues are partial (e.g., generosity)
  - Other virtues must be impartial (e.g., honesty)

Virtue Ethics Complements Other Theories

- Virtue ethics may not work as a stand-alone theory
- It may be a good complement to utilitarianism
- Allows rationale for action to be considered
- Solves problem of moral luck that plagued act utilitarianism (P.419)

Alternative, Discipline-Independent List of Fundamental Principles (PP. 419-420)

1. Be impartial.
2. Disclose information that others ought to know.
3. Respect the rights of others.
4. Treat others justly.
5. Take responsibility for your actions and inactions.
6. Take responsibility for the actions of those you supervise.
7. Maintain your integrity.
8. Continually improve your abilities.
9. Share your knowledge, expertise, and values.

9.5 Case Studies (PP. 421-427)

Case 1: Software Recommendation

- Sam Shaw asks for free advice on LAN security
- Prof. Smith answers questions and recommends top-ranked package
- Prof. Smith does not disclose
  - She has financial interest in company producing top-ranked package
  - Another package was given a “best buy” rating
- Did Prof. Smith do anything wrong?

Analysis

- Most relevant principles
  - Be impartial.
  - Disclose information others ought to know.
  - Share your knowledge, expertise, and values.
- Clause 1.06: Prof. Smith was deceptive
- Clauses 1.08, 6.02: Prof. Smith freely gave valuable information
- Clauses 4.05, 6.05: Prof. Smith did not reveal conflict of interest

Conclusion

- Professor Smith should have revealed her conflict of interest to Mr. Shaw.

Case 2: Child Pornography

- Joe Green a system administrator
- Asked to install new software package on Chuck Dennis's computer
- Green not authorized to read other people's emails or personal files
- Green sees suspicious-looking file names
- He opens some of Dennis's files and discovers child pornography
- What should he do?

Analysis (1/2)

- Most relevant principles
  - Be impartial
  - Respect the rights of others
  - Treat others justly
  - Maintain your integrity

Analysis (2/2)

- Most relevant clauses
  - 2.03: Somebody has misused the company PC
  - 2.09: Someone is using the PC for a purpose not in the employer's interest
  - 3.13: Joe violated the policy against opening files
  - 5.10: Someone else may have planted the files on Chuck's computer

Conclusions

- Joe was wrong to violate company policy to uncover child pornography
- Once he has this knowledge, however, he is obliged to share it with company authorities
- Joe should be discreet

Case 3: Anti-Worm

- Internet plagued by new worm that exploits hole in popular operating system
- Tim Smart creates anti-worm that exploits same security hole
- Tim's anti-worm fixes PCs it infects. It also uses these PCs as launch pad to reach new PCs.
- Tim launches anti-worm, taking pains to keep it from being traced back to him.
- The anti-worm quickly spreads through Internet, infecting millions of computers
- System administrators around the world combat the anti-worm

Analysis (1/2)

- Most relevant principles
  - Continually improve your abilities.
  - Share your knowledge, expertise, and values.
  - Respect the rights of others.
  - Take responsibility for your actions and inactions.

Analysis (2/2)

- Most relevant clauses:
  - 1.01: Tim did not accept responsibility for his action.
  - 1.08: The worm was free, but cost system administrators a lot of time.
  - 2.03: The anti-worm entered computers without permission of their owners.
  - 8.01, 8.02, 8.06: Tim improved his knowledge and skills by creating the anti-worm.

Conclusions

- Tim's welfare is less important than the public good
- By attempting to hide his identity, Tim refused to accept responsibility for his actions
- Tim violated the property rights of the PC owners whose systems were infected by his anti-worm
- Tim violated the Code

Case 4: Consulting Opportunity

- Jean works in support organization for Acme Corporation
- Many Acme customers downgrading their level of support
- East Dakota gives Jean opportunity to run a training class similar to that provided by Acme
- Jean tells no one at Acme
- Jean develops materials at home on own time
- Jean takes paid vacation to teach class

Analysis (1/2)

- Most relevant principles
  - Be impartial.
  - Take responsibility for your actions and inactions.
  - Disclose information that others ought to know.
  - Maintain your integrity.
  - Continually improve your abilities.

Analysis (2/2)

- Most relevant clauses
  - 3.04: Jean was well qualified to develop materials and teach class
  - 8.04: By creating materials, Jean became even more familiar with Acme's package and its capabilities
  - 4.05: Jean didn't disclose his conflict of interest with his employer
  - 2.08: Jean deprived himself of "time off" needed to do his best work at Acme
  - 6.05: Jean put his own interest above that of his employer

Conclusions

- Jean did not disclose East Dakota's offer or his decision to Acme's management
- Acme's management is likely to question Jean's loyalty to the company
- Jean's actions were wrong and unwise

9.6 Whistleblowing

Overview of Whistleblowing

- Whistleblower
  - Tries to report harmful situation through authorized channels
  - Rebuffed by organization
  - Makes disclosure through unauthorized channels
- Whistleblowers punished for their actions
  - Lose job or all chances of advancement
  - Financial and emotional hardship
- False Claims Act
- Whistleblower Protection Act

The *Challenger* Explosion Killed Seven Astronauts

Courtesy of NASA

Case: Morton Thiokol/NASA

- *Challenger* explosion
- Roger Boisjoly and Morton Thiokol engineers documented dangers of low-temperature launches
- Morton Thiokol executives and NASA officials overrode and hid concerns
- Boisjoly shared information with Presidential commission
- Morton Thiokol retaliated
  - Boisjoly took medical leave for stress, then quit
  - Found job as a consultant two years later

Case: Hughes Aircraft

- Factory for military-grade hybrid chips
- Some defective chips being approved
- Ruth Goodearl reported incidents to upper management
- Consequences for Goodearl
  - Harassed
  - Fired
  - Unemployment
  - Bankruptcy
  - Divorce
- Goodearl and Ruth Aldred sued Hughes Aircraft under False Claims Act and won

Motives of Whistleblowers

- People become whistleblowers for different reasons
- Morality of action may depend on motives
- Good motive
  - Desire to help the public
- Questionable motives
  - Retaliation
  - Avoiding punishment

Corporate Response to Whistleblowing

- Whistleblowers are disloyal
- Whistleblowing has many harms
  - Bad publicity
  - Disruption of organization's social fabric
  - Makes it hard for people to work as team
- If company causes harm, public can use legal remedies to seek damages
- Critique: Overly legalistic view of public harm?

Whistleblowing as Organizational Failure

- Whistleblowing harms organization
  - Bad publicity
  - Ruined careers
  - Erodes team spirit
- Whistleblowing harms whistleblower
  - Retaliation
  - Estrangement
- Organizations should improve communication
- Critique
  - Is this realistic?
  - Robert Spitzer: Organizations should return to using principle-based ethics in decision making

Whistleblowing as Moral Duty

Richard DeGeorge's questions for whistleblowing

1. Is serious harm to the public at stake?
2. Have you told your manager?
3. Have you tried every possible inside channel?
4. Do you have persuasive documented evidence?
5. Are you sure whistleblowing will work?

Under what conditions must you blow the whistle?

- DeGeorge: If all five conditions are met
- Others: If conditions 1-3 are met
- Still others: Whistleblowing is *never* morally required

Moral Responsibility

- Exclusive Responsibilities
  - Role responsibility
  - Causal responsibility
  - Legal responsibility
- Moral responsibility
  - Must be borne by people
  - Is not exclusive
- Michael McFarland: A team should be held to a higher level of moral responsibility than any of its members