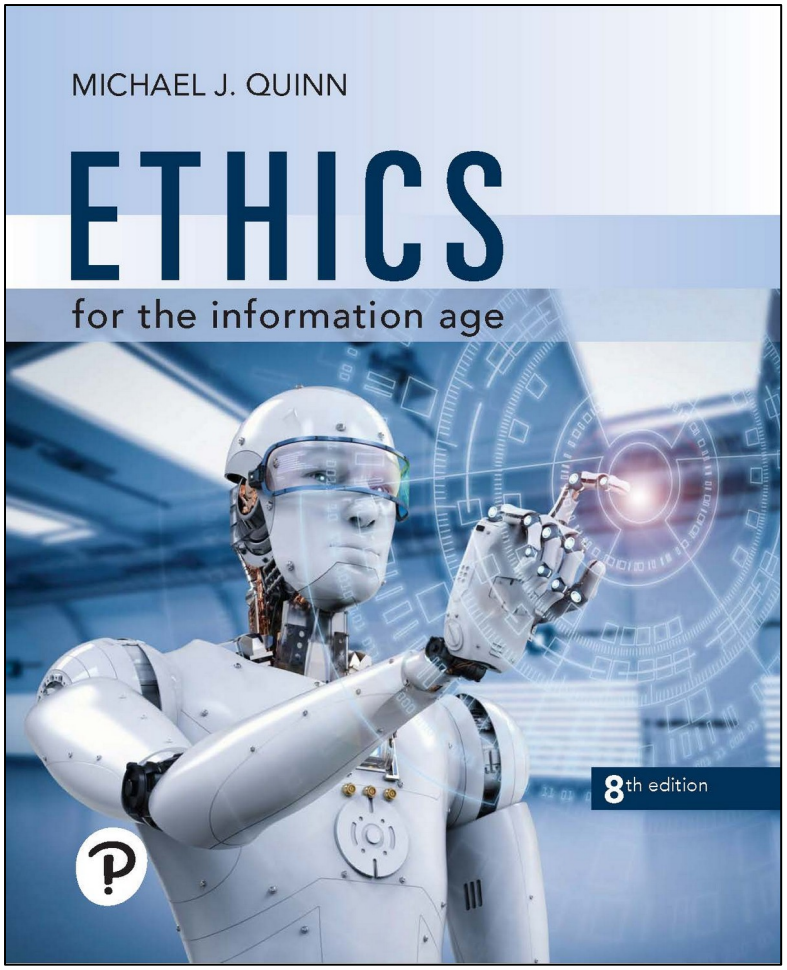
Ethics for the Information Age

Eighth Edition



Chapter 9

Professional Ethics

Pearson

Learning Objectives

9.1 Introduction

9.2 How well developed are the computing professions?

9.3 Software Engineering Code of Ethics

9.4 Analysis of the Code

9.5 Case studies

9.6 Whistle-blowing

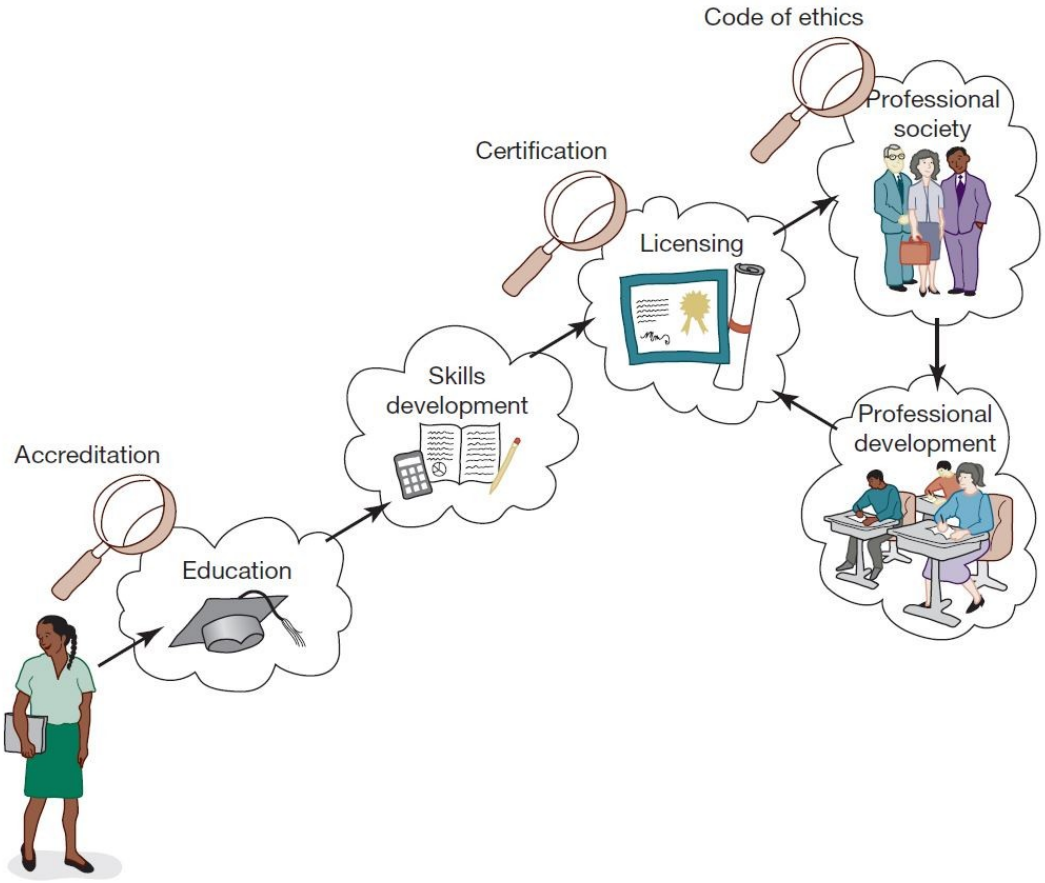
9.1 Introduction

- 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

Characteristics of a Profession

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

Attributes of a Mature Profession



A mature profession has eight attributes that enable it to certify new members and support existing members.

Case Study: Certified Public Accountants

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

How Do Computer-Related Careers Stack Up?

- 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

Status of Certification and Licensing

- Software engineer: someone engaged in development or maintenance of software, or teaches in this area
- Path to certification was attempted: similar to path taken by engineers in other disciplines, such as civil engineering
  - Four years of post-college work experience
  - Pass Fundamentals of Engineering (FE) exam
  - Pass discipline-specific Principles and Practice of Engineering (PE) exam
- Only 81 people nationwide took exam in first five years; exam has been discontinued

Ability to Harm Public

- Many computer professionals hold responsibilities similar to those held by members of mature professions
- Therac-25 killed or gravely injured at least six people
- Millions rely upon software rather than accountants to prepare their tax returns
- Millions of people rely on system administrators to keep their work-related information secure

The Importance of Taking Personal Responsibility

The ability to cause harm to members of the public is a powerful reason why those in computer-related careers must act according to ethical principles. Without universal certification and licensing and other components of a well-developed profession to rely upon, those in computer-related careers must take more personal responsibility for developing their ethical decision-making skills.

9.3 Software Engineering Code of Ethics

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”

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

Ensure Products Meet Highest Standards (1 of 2)

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

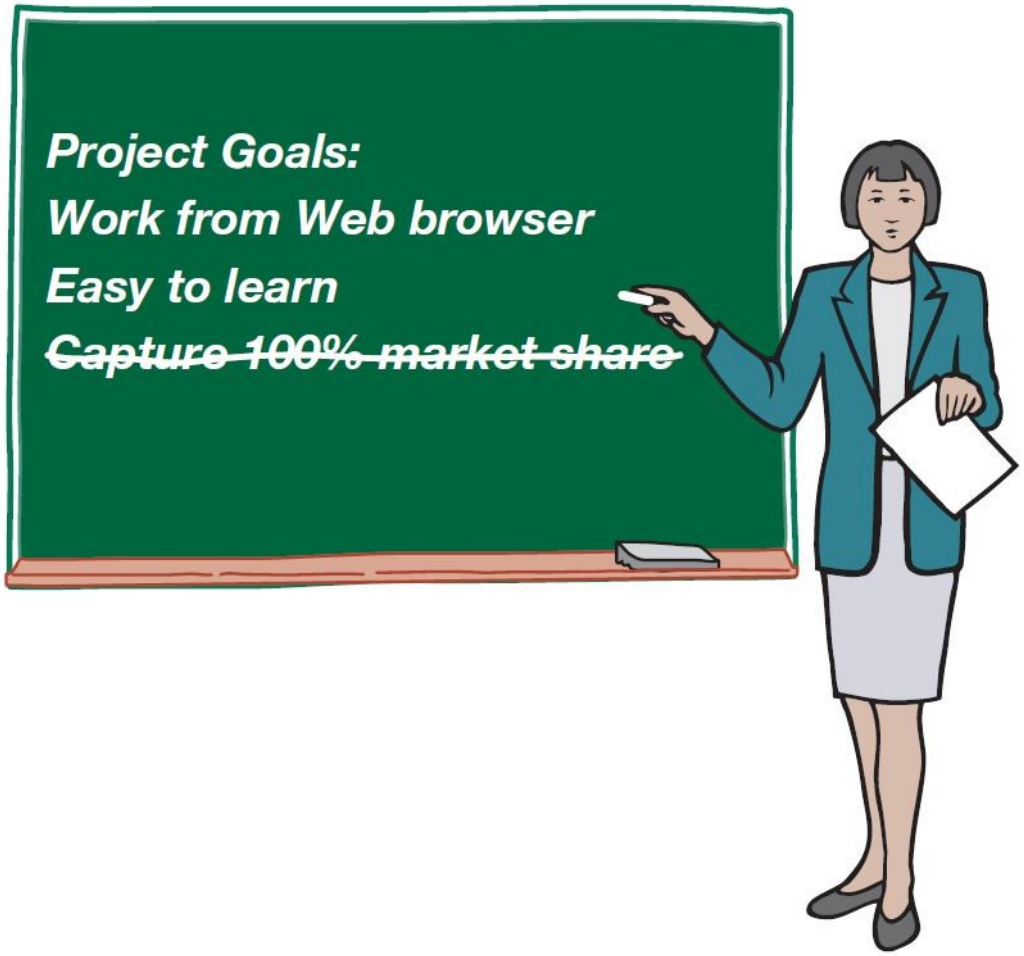
3.05 Use appropriate project methodologies

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 (2 of 2)

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 (1 of 2)

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 (2 of 2)

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 (1 of 2)

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

Advance the Profession (2 of 2)

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"

Realize that Doctors or other licensed professionals can lose the right to practice if they violate the codes. Computing people at worst are thrown out of ACM or IEEE professional societies.

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

Alternative, Discipline-Independent List of Fundamental Principles

- Be impartial.
- Disclose information that others ought to know.
- Respect the rights of others.
- Treat others justly.
- Take responsibility for your actions and inactions.
- Take responsibility for the actions of those you supervise.
- Maintain your integrity.
- Continually improve your abilities.
- Share your knowledge, expertise, and values.

9.5 Case Studies

Case: 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.

9.6 Whistle-Blowing

Overview of Whistle-Blowing

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

The Challenger Explosion

The explosion of the **Challenger** killed seven astronauts, including the first civilian in space, Christa McAuliffe. (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

Motives of Whistle-blowers

- People become whistle-blowers 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 Whistle-Blowing

- Whistle-blowers are disloyal
- Whistle-blowing 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?

Whistle-Blowing as Organizational Failure

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

Whistle-Blowing as Moral Duty

Richard DeGeorge's questions for whistle-blowing

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 whistle-blowing 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: Whistle-blowing 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

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