CS 4001: Computing, Society & Professionalism

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Week 5: Professional Ethics
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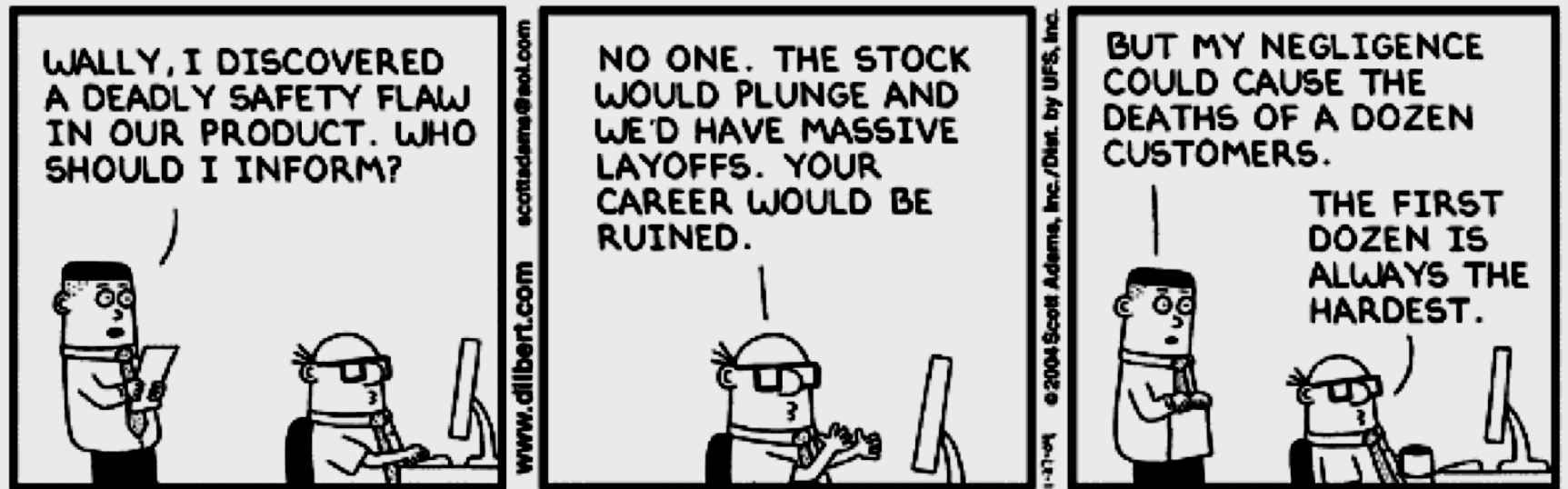# Do computer professional need to worry about ethics like lawyers or physicians?

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Therac-25

Privacy and security

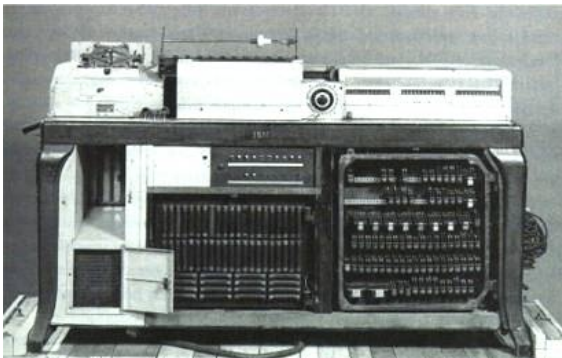Financial decisions (e.g., tax software)

A Computer Professional's Story

- Jacobus Lentz, Dutch inspector of population registries before World War II

- Partnership with the Nazi Government

- Role in Hitler's Final Solution

A Computer Professional's Story

- Lentz was in a position of great responsibility

- But lacked a moral compass

- Didn't anticipate the consequences of his actions
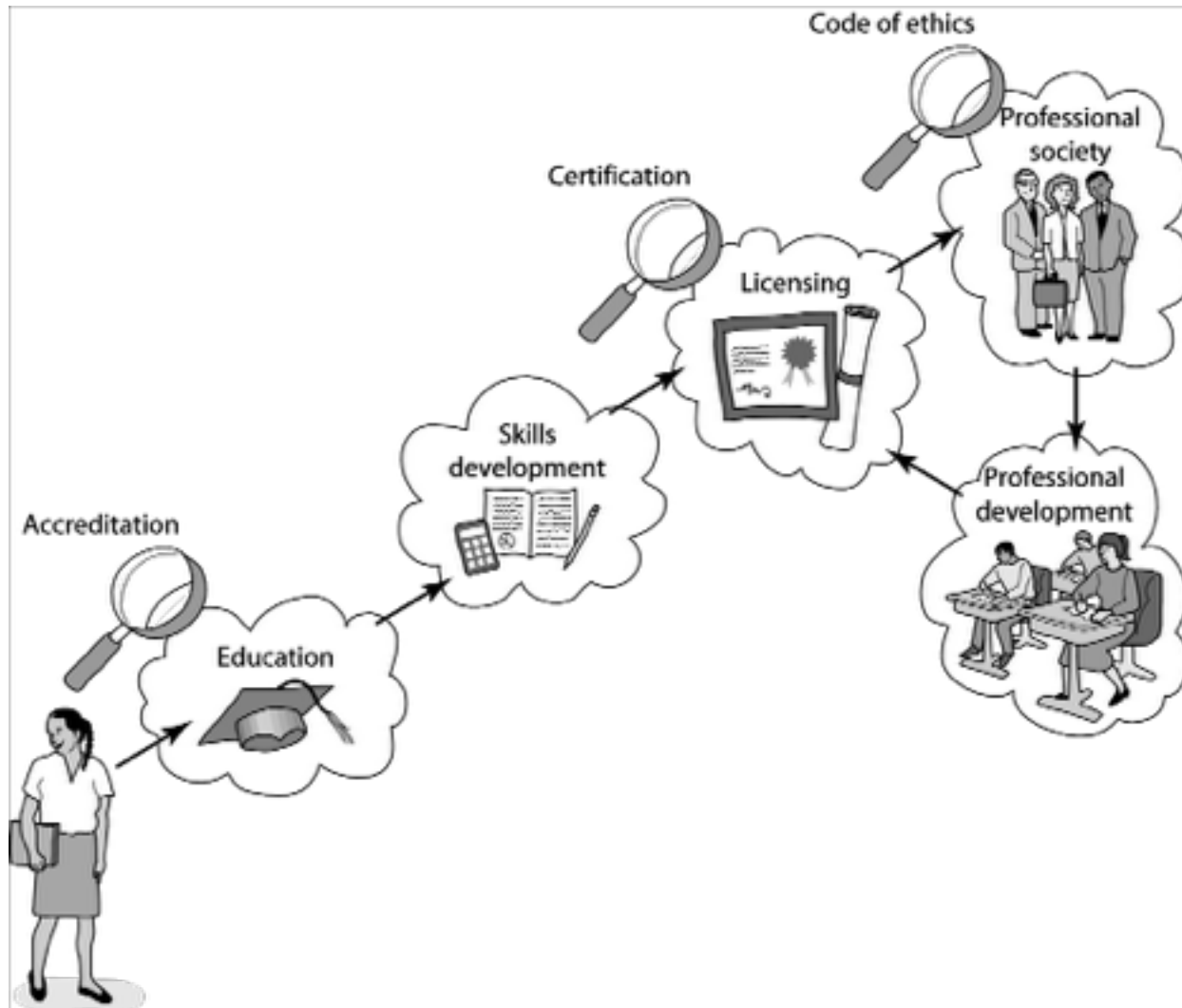   - He allowed his creativity, technical ability, and industriously to be abused by the Nazis.

Social Responsibilities of a Profession

Characteristics of a Profession

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

Attributes of a Mature Profession

History

- Computer profession was not a fully developed profession (e.g., license, certification, formal training and/or apprenticeship not required to be a programmer or a system analyst)

- IEEE Board of Governors established steering committee (May, 1993).

- ACM Council endorsed Commission on Software Engineering (Late 1993).

- Joint steering committee established by both societies (January, 1994).

Joint Commission Steering Committee

- 4 goals:
    - Adopt standard definitions.
    - Define required body of knowledge and recommended practices.
    - Define ethical standards.
    - Define educational curricula for undergraduate, graduate (Masters), and continuing education (for retraining and migration).

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

Software Engineering Code of Ethics: 8 Key Principles:

- Public

- Client and Employer

- Product

- Judgment

- Management

- Profession

- Colleagues

- Self

PUBLIC - Software engineers shall act consistently with the public interest

Clause 1.03
Approve Software Only If It Is Safe

CLIENT AND EMPLOYER - Software engineers shall act in a manner that is in the best interests of their client and employer, consistent with the public interest

Clause 2.02
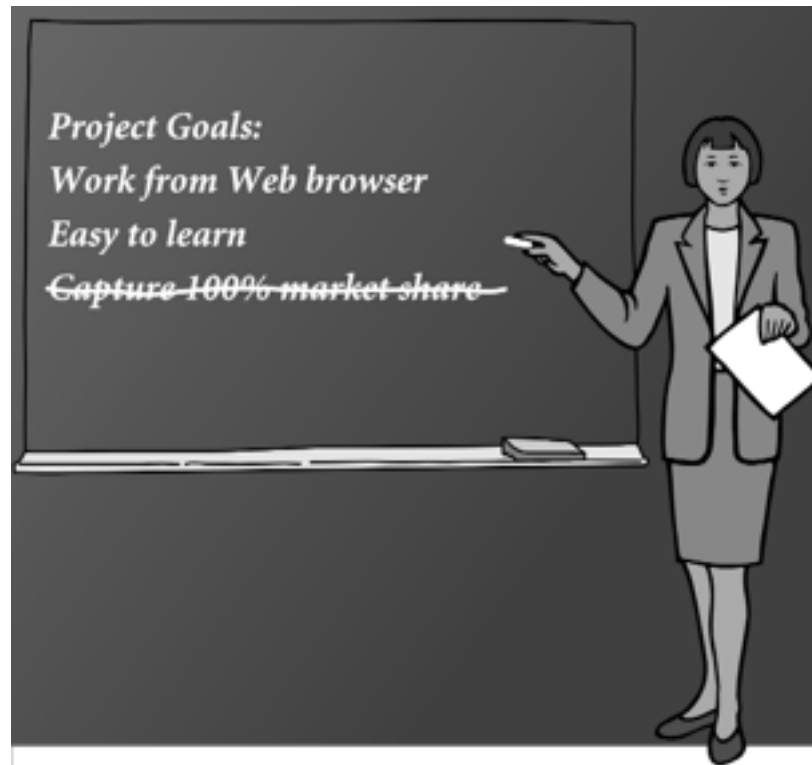# Don't Use Software Obtained Illegally

PRODUCT - Software engineers shall ensure that their products and related modifications meet the highest professional standards possible

Clause 3.02
"Ensure Proper and Achievable Goals"

JUDGMENT - Software engineers shall maintain integrity and independence in their professional judgment

MANAGEMENT - Software engineering managers and leaders shall subscribe to and promote an ethical approach to the management of software development and maintenance

PROFESSION **-** Software engineers shall advance the integrity and reputation of the profession consistent with the public interest

Clause 6.01   Help Create An Environment Supporting Ethical Conduct

COLLEAGUES - Software engineers shall be fair to and supportive of their colleagues

SELF - Software engineers shall participate in lifelong learning regarding the practice of their profession and shall promote an ethical approach to the practice of the profession

Clause 8.02   Improve Ability to Create High Quality Software

Analysis of the Code

- The code is expressed a s collection of rules

- The rules in turn are based on principles grounded in different ethical theories

- When we encounter a situation when two rules conflicts, the preamble urges us to ask questions that will help us consider the principles underlying the rules

Analysis of the Code

- Questions demonstrating the multi-faceted grounding of the code:
    - Who is affected? (utilitarianism – collective goodness)
    - Am I treating other humans with respect? (Kantianism – mentally reversing roles)
    - Would my decision hold up to public scrutiny? (Virtue ethics – reflection on moral character)
    - How will those who are least empowered be affected? (Social contract theory)
    - Are my acts worthy of the ideal professional? (Virtue ethics – imitation of morally superior role models or exemplars)

Alternative 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

Class Activity 1 – Analyze the Software Engineering Code of Ethics

Class Activity 1 – Software Recommendation

- Relevant fundamental principles:
  - Be impartial
  - Disclose information that others ought to know
  - Share your knowledge, expertise, and values

- List of clauses associated with these fundamental principles:

  - (Public) 2.06   Be fair and truthful in all matters

  - (Public) 2.08   Donate professional skills to good causes

  - (Judgment) 3.06   Disclose conflicts of interest

  - (Judgment) 3.07   Avoid conflicting financial interests

  - (Profession) 6.09   Place professional interests before personal

  - (Profession) 6.13   Share software knowledge

Class Activity 1 – Software Recommendation

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    - (Public) 2.06   Be fair and truthful in all matters
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    - (Profession) 6.09   Place professional interests before personal
    - (Profession) 6.13   Share software knowledge

Conclusion

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

Class Activity 2 – Analyze the Software Engineering Code of Ethics

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

Extra Slides

Principle 2: Public

- 2.01   Disclose any software-related dangers
- 2.02   Approve only safe, well tested software
- 2.03   Only sign documents in area of competence
- 2.04   Cooperate on matters of public concern
- 2.05   Produce software that respects diversity
- 2.06   Be fair and truthful in all matters
- 2.07   Always put the public's interests first
- 2.08   Donate professional skills to good causes
- 2.10   Accept responsibility for your own work

Principle 4: Client and Employer

- 4.02   Ensure resources are authentically approved

- 4.03   Only use property as authorized by the owner

- 4.04   Do not use illegally obtained software

- 4.05   Honor confidentiality of information

- 4.06   Raise matters of social concern

- 4.07   Inform when a project becomes problematic

- 4.08   Accept no detrimental outside work

- 4.09   Represent no interests adverse to your employer

Principle 1: Products

- 1.01   Ensure adequate software specification
- 1.05   Ensure proper methodology use
- 1.06   Ensure good project management
- 1.07   Ensure all estimates are realistic
- 1.08   Ensure adequate documentation
- 1.09   Ensure adequate testing and debugging
- 1.10   Promote privacy of individuals
- 1.12   Delete outdated and flawed data
- 1.13   Identify and address contentious issues
- 1.15   Follow appropriate industry standards

Principle 3: Judgment

- 3.01   Maintain professional objectivity

- 3.02   Only sign documents within your responsibility

- 3.03   Reject bribery

- 3.04   Do not accept secret payments from the client

- 3.05   Accept payment from only one source for a job

- 3.06   Disclose conflicts of interest

- 3.07   Avoid conflicting financial interests

- 3.08   Temper technology judgments with ethics

Principle 5: Management

- 5.01   Assure standards are known by employees

- 5.02   Assure knowledge of confidentiality protocols

- 5.03   Assign work according to competence

- 5.04   Provide due process for code violations

- 5.06   Accurately describe conditions of employment

- 5.07   Offer only fair and just remuneration

- 5.08   Do not prevent a subordinate's promotion

- 5.09   Do not ask a person to breach this code

Principle 6: Profession

- 6.01   Associate with reputable people
- 6.02   Promote commitment of this code
- 6.03   Support followers of this code
- 6.05   Report suspected violations of this code
- 6.06   Take responsibility for errors
- 6.07   Only accept appropriate remuneration
- 6.09   Place professional interests before personal
- 6.10   Obey all laws governing your work
- 6.13   Share software knowledge with the profession

Principle 7: Colleagues

- 7.01   Assist colleagues in professional development

- 7.02   Review others' work only with their consent

- 7.03   Credit fully the work of others

- 7.04   Review others work candidly

- 7.05   Give fair hearing to colleagues

- 7.06   Assist colleagues' awareness of work practices

- 7.08   Do not hinder a colleague's career

- 7.09   Do not pursue a job offered to a colleague

- 7.10   Seek help with work outside your competence

Principle 8: Self

- 8.01 Further your own professional knowledge

- 8.02 Improve your ability to produce quality work

- 8.03 Improve your ability to document work

- 8.04 Improve your understanding of work details

- 8.05 Improve your knowledge of relevant legislation

- 8.06 Improve your knowledge of this code

- 8.07 Do not force anyone to violate this code

- 8.08 Consider code violations inconsistent with software engineering

Whistle-Blowing

- A whistle blower is someone who breaks ranks with an organization in order to make an unauthorized disclosure of information about a harmful situation after attempts to report the concerns through authorized organizations channels have been ignored or rebuffed.

- Examples situations:
    - Actions/products of employer can potentially harm the public
    - Fraudulent use of tax dollars

Roger Boisjoly/NASA

- Engineer at Morton Thiokol – NASA contractor for the Challenger Space Shuttle
  - Met with accident 73 seconds after launch; gas leak from a booster rocket
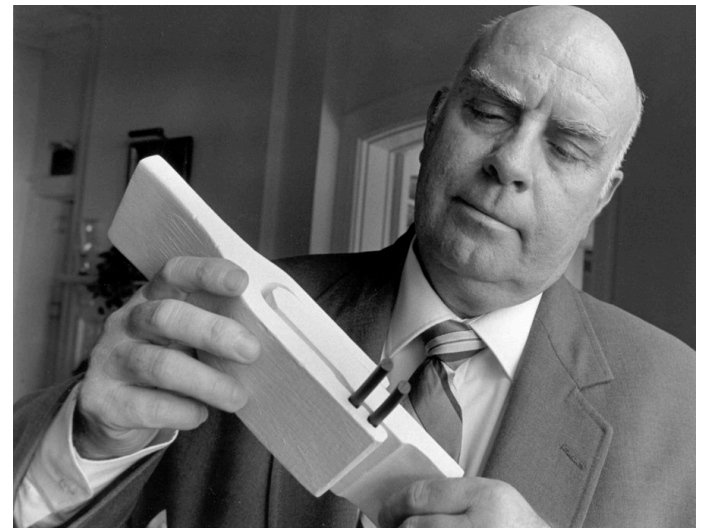
Morality of Whistle-Blowing

- In most cases whistle-blowers are punished

- Are they heroes or traitors?
    - Analyze their motives (virtue ethics theory)

- Do whistle-blowers cause harm?
    - Disruption of an organization's social and professional fabric
    - Generate bad publicity
    - Cause emotional distress and financial hardship to family
    - Assess the net public good – utilitarian perspective

Whistle-Blowing as a Moral Duty

- Richard De George's five questions:
    - Do you believe the problem may result in "serious and considerable harm to the public"?
    - Have you told your manager your concerns about the potential harm?
    - Have you tried every possible channel within the organization to resolve the problem?
    - Have you documented evidence that would persuade a neutral outsider that your view is correct?
    - Are you reasonably sure that if you do bring this matter to public attention, something can be done to prevent the anticipated harm?

- Whistle-blow is your right if you answer "yes" to the first three questions. If you answer "yes" to all five, then it is your moral duty.