



Software Engineering Code of Ethics and Professional Practice



Version 5.2, 1999



‘When the devils will come and visit us, they will not have big horns. It will not hurt, it does not hurt a living being. It will just arrange to lower our levels of ethics. Just a little. And the rest will follow...’

Albert Brooks in the movie ‘Broadcast News’

Content

1. Introduction
2. Benefits of adopting a Code of Ethics
3. Purpose of the Code
4. Overview of the Code

IEEE - Institute of Electrical and Electronic Engineers

ACM - Association for Computing Machinery

Source: - Gotterbarn, D., Miller, K., Rogerson, S., 'Computer Society and ACM Approve Software Engineering Code of Ethics', IEEE Computer, Octobre 1999.
- Course Notes INM 6000, UQàM.
- Anderson, R.E., Johnson, D., Gotterbarn, D., Perrolle J., 'Using the New ACM Code of Ethics in Decision Making', Communications of the ACM, February 1993.

11/27/2009

3

Introduction

- Ethics is not a matter of true or false, black or white or good or bad.
- Ethics deals with 'grey areas', perceptions, values and intent of the individual / entity performing the act.

11/27/2009

4

A Few Issues

1. Growing importance of software in society
2. Increasing public awareness
3. Software is an invisible and intangible threats
4. Profitability, safety and security
5. Increased awareness of legislators (i.e. Governments)
6. 'Formalization' of a software engineering profession

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5

Benefits of adopting a Code of Ethics

- 1. Attracts new employees**
 - Attracts dedicated and committed employees that want to be involved in an organization that produces quality software.
- 2. Promotes a good image for a company**
 - This let the public know that the company works for the public good and proudly accepts this responsibility.
- 3. Promotes a Professional Image**
 - Increases public respect your company and improve the quality of software it produces.

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6

Benefits of adopting a Code of Ethics

4. Increases Public Confidence

- Informs the public that their interests are met in full confidentiality and with high standards.

5. Promotes the Deployment and adoption at the international level

- A code adopted across the planet by all software engineers and their employers
- Software engineers will make these principles a practice of each day and produce quality products.

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7

Importance of Software Engineers

- Because of their roles in developing software systems, software engineers have significant opportunities:
 - To do good or cause harm,
 - To enable others to do good or cause harm,
 - To influence others to do good or cause harm

11/27/2009

8



Software Engineering Code of Ethics and Professional Practice



- Developed by a multinational task force with additional input from other professionals from
 - industry, government posts, military installations, and educational professions.
- Adopted by the Computer Society and the ACM
- The Code contains eight Principles related to the behavior of and decisions made by professional software engineers, including practitioners, educators, managers, supervisors, and policy makers, as well as trainees and students of the profession.

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9

Purpose of the Code

1. Is intended as a standard for teaching and practicing software engineering,
2. Documents the ethical and professional obligations of software engineers.
3. Instructs practitioners about:
 - The standards society expects them to meet,
 - About what their peers strive for
 - About what to expect of one another.
4. Informs the public about the responsibilities that are important to the profession.

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10

Software Engineering Code of Ethics and Professional Practice

- The list of Principles and Clauses is not exhaustive.
- The Clauses should not be read as separating the acceptable from the unacceptable in professional conduct in all practical situations.
- The Code is not an ethical algorithm that generates ethical decisions.
 - In some situations, standards may be in tension with each other or with standards from other sources.

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11

Public Interest

- Concerns for the health, safety and welfare of the public is paramount;
 - i.e. that the public interest is central to the code of ethics.
- The eight principles have been ordered (prioritized) to reflect the order in which the software business should consider their moral obligations.

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12

Principles

1. **PUBLIC** - Software engineers shall act consistently with the public interest.
2. **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.
3. **PRODUCT** - Software engineers shall ensure that their products and related modifications meet the highest professional standards possible.
4. **JUDGMENT** - Software engineers shall maintain integrity and independence in their professional judgment.
5. **MANAGEMENT** - Software engineering managers and leaders shall subscribe to and promote an ethical approach to the management of software development and maintenance.
6. **PROFESSION** - Software engineers shall advance the integrity and reputation of the profession consistent with the public interest.
7. **COLLEAGUES** - Software engineers shall be fair to and supportive of their colleagues.
8. **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

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13

Principle 1- Public

- Software engineers shall act consistently with the public interest. In particular, software engineers shall, as appropriate:
 - 1.01. [Accept full responsibility](#) for their own work.
 - 1.02. [Moderate the interests](#) of the software engineer, the employer, the client, and the users with the public good.
 - 1.03. [Approve software](#) only if they have a well-founded belief that it is [safe](#), [meets specifications](#), passes appropriate [tests](#), and does not diminish quality of life, diminish privacy, or harm the environment. The ultimate effect of the work should be to the public good.
 - 1.04. [Disclose](#) to appropriate persons or authorities any actual or [potential danger](#) to the user, the public, or the environment, that they reasonably believe to be associated with software or related documents.

11/27/2009

14

Principle 1- Public

- Software engineers shall act consistently with the public interest. In particular, software engineers shall, as appropriate:
 - 1.05. Cooperate in efforts to address matters of grave public concern caused by software, its installation, maintenance, support, or documentation.
 - 1.06. Be fair and avoid deception in all statements, particularly public ones, concerning software or related documents, methods, and tools.
 - 1.07. Consider issues of physical disabilities, allocation of resources, economic disadvantage, and other factors that can diminish access to the benefits of software.
 - 1.08. Be encouraged to volunteer professional skills to good causes and to contribute to public education concerning the discipline.

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15

Principle 2 – 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. In particular, software engineers shall, as appropriate:
 - 2.01. Provide service in their areas of competence, being honest and forthright about any limitations of their experience and education.
 - 2.02. Not knowingly use software that is obtained or retained either illegally or unethically.
 - 2.03. Use the property of a client or employer only in ways properly authorized, and with the client's or employer's knowledge and consent.

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16

Obligations of the Software Engineer

- **The engineer has obligations to:**
 - His employer
 - Users
 - Customers
 - Colleagues
 - The Management
 - The public (e.g. tax payers)
 - The law makers
- **The engineer must address the following issues:**
 - The product
 - The process
 - The social interactions when developing a product

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17

Obligations of the Employer

- A company must develop a work environment that allows an engineer to carry out his duties in a manner that conforms to accepted standards.
- This can be accomplished as follows:
 - The company must provide a written standard of conduct that it expects employees in carrying out their tasks;
 - The company must provide a set of development standards and says 'how' work must be carried out;
 - The company must provide the means by which an employee can express its disapproval on how the company conducted a business transaction.

11/27/2009

18

Obligations of the Employer

- Willingness to perform a task poorly because a client requested it is not acceptable.
- Must establish performance standards to replace the demands of a client, even if the client wants to assume the risks.
- The employer may have someone who will play the role of 'Ethics Director'

11/27/2009

19

Obligations of the Customer

- **The customer must accept its responsibility as a customer, he must:**
 - Provide and/or accept responsibility for the requirements of the system;
 - Make sure the contractor (developer) has the ability to execute the contract;
 - Ensure that the contractor performs the contract properly.

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20

Roadmap

1. Is this behaviour/decision legal ?
2. What will my decision look over time?
3. What would it look in a newspaper?
4. Am I going to sleep well tonight?
5. What will I say to my kids, my parents, my friends, my colleagues?

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21

How good is good enough ?

- **Issues to debate**
 1. Good enough user interface
 2. Good enough plan
 3. Good enough quality
 4. Good enough testing

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22

Conclusion

- **Ethics is a set of issues involving personal values such as honesty, justice and trust.**
 - Business issues involve economic indicators such as income, profit, production units, etc.
- **Communication is the key to most questions or perceptions of unethical conduct in the business environment.**
- **The best insurance against unethical activities for a company, or a group is:**
 - To foster an environment where employees feel confident to communicate their thoughts and ask questions if they feel that something is not done in an ethic way.

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23

Codes of Ethics

- **IEEE-Computer Society/ACM**
 - <http://computer.org/computer/code-of-ethics.pdf>
- **Code of Ethics translated in 8 languages**
 - <http://seeri.etsu.edu/Codes/default.shtm>
- **CIPS**
 - <http://www.cips.ca/membership/ethics.htm>
- **American Society for Quality (ASQ)**
 - <http://www.asq.org/join/about/ethics.html>
- **Quality Assurance Institute (QAI)**
 - <http://www.qaiusa.com/certification/code-of-ethics.html>

11/27/2009

24