



東京工業大学
Tokyo Institute of Technology

Science and Engineering Ethics

Week 3: How to Make Ethical Decisions

How Should Engineers Make an Ethical Decision?

Peculiarity regarding engineering ethics (engineer's own action design) = new action design is always required.



Therefore. . .

How Should Engineers Behave?

Goal of engineering ethics

(Ability to acquire (i.e., improve) through learning “engineering ethics”)

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Engineers and organizations will discover engineering-related problems and further improve comprehensive problem solving abilities while assessing the relative balance among various values, such as cultural and environmental values, not limited to those in science and engineering. This is a process they both attempt and actually realize.

Solving Ethical Problems = Designing Your Own Action

- Engineers grasp the reality of ethical problems and consequences.
- To resolve an ethical problem is to design your own actions so that multiple values can be satisfied.



Let's design your own actions
How would you design your own actions in the following mini case?

Seven-Step Guide for Ethical Decision Making (KIT version)

0. Imagine how you would behave if you were in the described situation.
1. State the problem
2. Check the facts
3. Identify stakeholders and their values
4. List options (they should be as concrete as possible)
5. Evaluate options using ethics tests
6. Make a choice
7. Review steps 1-6 and develop measures to prevent such ethical problems from happening

Mini Case

Hypothetically, you have just completed graduate school with a degree in environmental studies. You are newly employed by a promising, local company. You are the only child in your family and your parents are very happy that you will be able to stay in your hometown for work. You are satisfied with this situation as well.

Mini Case (cont.)

One day, you are ordered to work overtime by your superior (section chief). You go to a warehouse as instructed by your superior and discover a drum-shaped canister with unknown contents. Your superior orders you to help throw the contents of the canister in a river flowing near the company premises.

Mini Case (cont.)

You were told not to ask questions about the contents but it seemed to you that the substance could adversely affect the environment in many ways. You are compelled to draw the attention of your superior the moment you feel misgivings and oppose the order. However, you are grateful to have been employed by the company and would like to avoid an awkward situation. Nevertheless, as an engineer, you hesitate to obey the instructions given by your superior.

Your superior has ordered you to obey the instructions, using a stern tone and thus, you begin to think whether you should obey such instructions.

What would you do from the viewpoint of an engineer if you faced this situation?

Solving Ethical Problems = Deciding Your Own Action

- Were you able to design your own action well?
↓↑
- Appropriate design → Resolution of ethical problems
To resolve an ethical problem is **to design your own actions** so that multiple values can be satisfied

↓How will you design your own actions?

Seven-Step Guide

Seven-Step Guide

Guidelines for ethical decision making

1. Clearly state the problem.
2. Check the facts.
3. Identify relevant factors.
4. Develop a list of options.
5. Test the options: Review options using ethics tests: harm test, reversibility (golden rule) test, universalizability test, virtue test (mirror test), publicity test, defensibility test, colleague test, professional test, organization test, and the like.
6. Make a choice: Decide upon the actions to be undertaken based on the results of a review of Steps 1 through 5.
7. Reexamine the steps outlined in Steps 1 through 6, thinking about what policies should be undertaken in order to avoid the same ethical problem again and consider how to improve the situation.

Seven-Step Guide

- Not all problems can be resolved based on this seven-step method.

However . . .

- This method will assist by warning you to avoid emotional and short-sighted actions and to think about methods to address the situation calmly and reasonably

Seven-Step Guide

Think about all of the steps in the Seven-Step Guide during actual practice.

Case example to be reviewed: Previous mini case

Tips for Using the Seven-Step Guide

1. **State the problem** : When you think about ethical problems, it is important to first think about what types of problems you are dealing with.
 - There are two typical types of ethical problems
 - Dilemma problems : It is difficult to please everyone (e.g., in order to protect public safety, it seems that loyalty to affiliated organizations must be sacrificed).
 - Line-drawing problems : The range of an action should be identified as to whether or not such action would be permitted (e.g., the extent of safety that must be preserved by cost containment).

Tips for Using the Seven-Step Guide

2. **Check the facts** : Identify ambiguous or speculative suppositions as well as facts that are already known. Moreover, review the facts necessary for thinking about the ethical problems.

Tips for Using the Seven-Step Guide

3. **Identify relevant factors.** : Identify the stakeholders as well as the associated laws and regulations, without fail.

⇒ Caution : When examining Steps 1 through 3, clarify the facts, the associated factors, and the problems.

Tips for Using the Seven-Step Guide

4. **Develop a list of options** : Choosing between two options is not generally desirable. Use your imagination, based on the information acquired through the steps thus far, to specifically think about the best actions, such as who to consult with and what is the best method of communication.
- Dilemma problems → Creative “middle way” method
 - Line-drawing problems → Casuistry

Tips for Using the Seven-Step Guide

5. Test the options :

⇒ Ethics tests that are often used:

- Reversibility (golden rule) test: Think about whether or not you would make the same decision if you were in the position of a stakeholder (i.e., a user) directly influenced by the action that you are about to undertake.
- Universalizability test: Think about the consequences if everyone were to undertake the action that you are about to undertake.
- Other tests: Use various tests and relevant reviews from differing viewpoints.

Options

1. Without protesting, you obey the instructions of your superior, and you to help throw the contents of the canister in the river.
2. You check the facts including the nature of the contents of the canister by asking your superior, and if there is no problem, you obey the instructions.
3. At this point you obey the instruction, and you will check the facts at an appropriate time.
4. You explain various environmental problems publicized in media such as news papers; you ask your superior about the nature of the contents of the canister; and if there is no problem, you obey the instructions. But, if there seems to be some problem, you try to persuade the superior to reconsider.
5. If you can't persuade the superior, you don't obey the instructions and consult with you colleagues and other superiors.

Options

1. Obey the instructions of your superior, and you to help throw the contents of the canister in the river
 - Reversibility (Golden Rule) Test ×
 - Universalizability Test

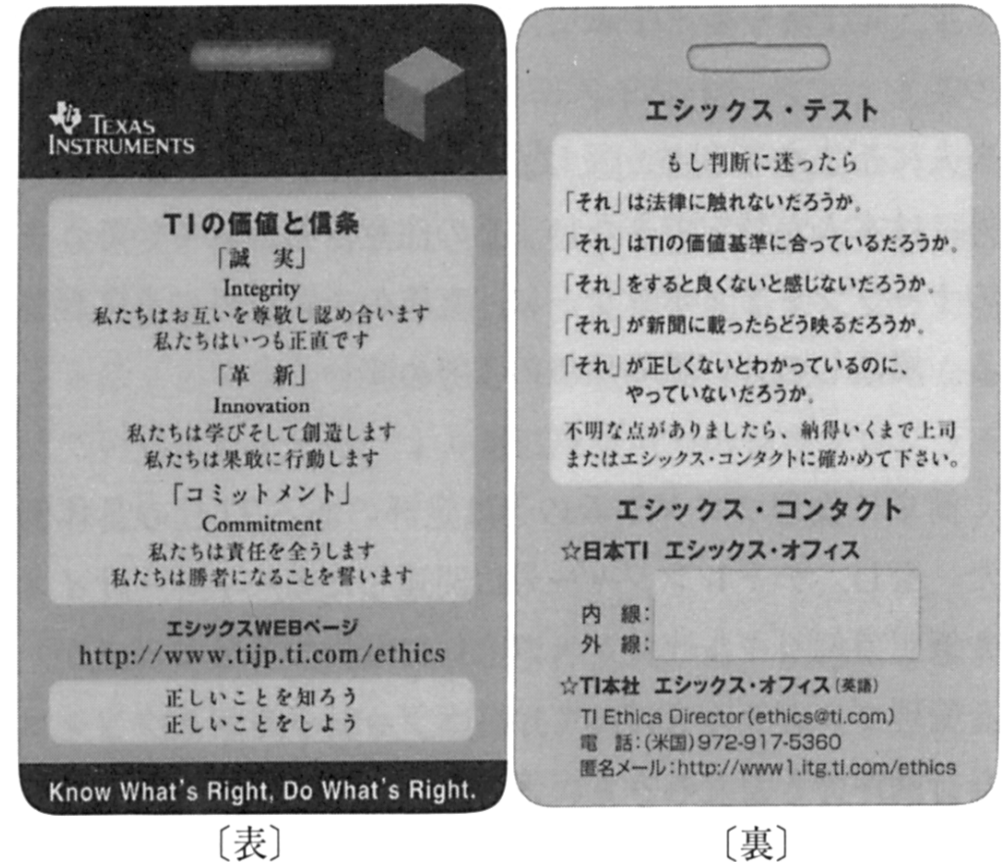
Options

1. Without protesting, obey the instructions of your superior, and you to help throw the contents of the canister in the river.

- Reversibility (Golden Rule) Test ×
- Universalizability Test ×

(Supplementation) Practical Company Examples

- Various companies have actually adopted and practiced ethics tests and ethical decision-making (“action design”) training.
- Example: Texas Instruments Incorporated (TI)
 - Ethical training has been implemented for TI employees throughout the world once every two years.
 - Workers carry an “Ethics Card” (depicted on the right).



Tips for Using the Seven-Step Guide (cont.)

6. Make a choice: Decide upon the actions to be undertaken based on the results of a review of Steps 1 through 5.

Tips for Using the Seven-Step Guide (cont.)

7. Review steps 1-6: Reexamine the steps outlined in Steps 1 through 6, thinking about what policies should be undertaken in order to avoid the same ethical problem again and consider how to improve the situation.

Seven-Step Guide

- Not all problems can always be resolved based on this seven-step method.

However...

- This method will be of help in giving you warnings not to undertake emotional and short-sighted actions, and to think about methods for handling the situation calmly and reasonably.

Definition of Profession

- Avowal, confession, and declaration: a profession of loyalty
- Confession of faith ; confessed faith ; oath of entering a sect: a declaration
- Professions and (in particular) intellectual professions: the (learned) professions (i.e., the three occupations of divinity, law, and medicine)
- Syndicates of those who are in the same field of work (i.e., companions)

Kenkyūsha's New Japanese-English Dictionary, 5th Edition, 1980

Profession and the Social Contract Model

- Long-term intellectually specialized education and training are required.
- Services are provided by a small, almost exclusive group for society (services necessary for human well-being).
- High social status and remuneration are provided.
- Ethical standards/codes of conduct are established and autonomy is preserved.

History of Codes of Ethics in the US

1847	アメリカ医師会 (American Medical Association: AMA)
1908	アメリカ弁護士協会 (American Bar Association: ABA)
第1期 職業倫理強調の段階 (Phase 1 The Professional-Conduct Phase)	
1911	コンサルティング・エンジニア協会 (American Institute of Consulting Engineers)
1912	アメリカ電気技術協会(American Institute of Electrical Engineers: AIEE) <この組織は、1963年に現在の電気電子技術者協会(the Institute of Electrical and Electronics Engineers: IEEE)となる>
1914	アメリカ機械技術者協会(American Society of Mechanical Engineers: ASME) アメリカ土木技術者協会 (American Society of Civil Engineers :ASCE)

History of Codes of Ethics in the US (Cont.)

第2期 公的使命の段階 (Phase 2 The Public Mission Phase)

1947	技術者専門能力開発協議会 (Engineers' Council for Professional Development : ECPD) <The predecessor of ABET>
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第3期 環境への配慮の段階 (Phase 3 The Environmental Concern Phase)

1977	ASCE included a clause related to the concerns for environment
1983	ASCE considered to include clearer guidelines on environments, but decided not to do so
1985	世界技術組織連盟 (World Federation of Engineering Organizations: WFEO) published 「エンジニアのための環境倫理綱領」 (Code of Environmental Ethics for Engineers)」
1990	IEEE revised its code and included environment concerns
1996	ASCE incorporated the idea of sustainable development into Fundamental Canon 7 of its code of ethics
1998	ASME added Fundamental Cannon 8 on environment

Public Safety, Health, and Welfare

Fundamental Canon 1

Engineers shall hold paramount the safety, health, and welfare of the public in the performance of their professional duties.

Faithfulness to Employers and Clients

Fundamental Canon 4

Engineers shall act in a professional manner for each employer or client as faithful agents or trustees and shall avoid conflicts of interest.

Avoidance of Conflicts of Interest

Guideline 4a

Engineers shall avoid all known or potential conflicts of interest with their employers or clients and shall promptly inform their employers or clients of any business association, interests, or circumstances that could influence their judgment or the quality of their services.

History of Engineering Societies and Codes of Ethics in Japan

- 1938 "Civil Engineer's Code of Ethics and Practice Rules" Japan Society of Civil Engineers
- 1961 "Code of Ethics for Services of Professional Engineers" The Institution of Professional Engineers, Japan
- 1996 "Code of Ethics" Information Processing Society of Japan
- 1998 "Code of Ethics" The Institute of Electrical Engineers of Japan
- 1998 "Code of Ethics" The Institute of Electronics, Information, and Communication Engineers
- 1999 "Code of Ethics for Civil Engineers" Japan Society of Civil Engineers
- 1999 "Code of Ethics and Code of Conduct" Architectural Institute of Japan
- 1999 "Code of Ethics" The Japan Society of Mechanical Engineers
- 2001 "Code of Ethics" and "Behavior Guidelines" Atomic Energy Society of Japan