A Categorization of Ethical Dilemmas in Software Engineering

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This talk is based on our IEEE Computer Article of Jan 2009
Many types of behavior are categorized

For example, we can categorize workplace behavior*:

• Commanders - Demanding and domineering
• Drifters - Free spirited and easy going
• Attackers - Angry and hostile
• Pleasers - Thoughtful, pleasant and helpful
• Performers - Flamboyant and loud
• Avoiders - Stereotypical wallflowers
• Analyticals - Cautious, precise and diligent
• Achievers - Content, peaceful and pleasant

*The Eight Classic Types of Workplace Behavior, HR Magazine, Sept, 2000 by Francie M. Dalton
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We can categorize types of behavior* (behavioral psychology)

- Bandwagon: arguing that an action or position should be taken because "everyone is doing it." ("Join the millions who are benefiting from this great new breakthrough!")

- Domino Theory/Slippery slope: claim that a first step leads inevitably to other steps or to disastrous results.

- Red Herring: introducing a side issue or an irrelevant issue to divert attention from the real issue.

- Two Wrongs Make a Right: a wrong justified by pointing out the wrongs of others.

- False Dilemma (Either-Or): allowing for only two courses of options, one of which must be chosen when others may be available or they may both be possible at the same time.

- Straw Man: altering or exaggerating an opponent's position for the sake of attacking it.

- ...

*http://www.gettingthegirls.com/practicalpsychology.htm

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Why Not Categorize Ethical Dilemmas in Engineering?

We believe that once the behaviors have been categorized and identified, they will be easier to prevent!
Tell the client that the project is on time.
But the project is 6 months late. That would be lying!
So what! We’ve always done it that way. Looks good on the books.
But that is a “Red Lie”. It is a violation of corporate policy.
Uhhh, on second thought, tell the client the truth.
This dilemma occurs when an individual is asked to create or accept a schedule that is obviously impossible to meet without working horrific hours.

Mission impossible seems to be standard practice in some unhealthy work environments.
Mea culpa

So there was a bug in the new office software?

That's right. That private e-mail from June’s friend was sent to the whole company instead of just June.

Intentional delivery of a product that still lacks key functionality or has known software defects.

$ Risk

Release Date

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Rush job

Intentional delivery of a poor quality product, trading time for quality. For example, a developer working on a software product delivers working code, but the quality of the product is shoddy, with minimal or no rationale and little or no documentation. The developer might feel under pressure to deliver, becoming more concerned about meeting milestones than ensuring quality.

There is a big difference between unethical behavior and incompetence!

That’s right. A million lines of code with no annotation! They did find one comment written in Persian that turned out to be a magical incantation. If you take the line out the system stops working.
Not my problem

Concern with day-to-day activities, accepting the development culture’s status quo and showing no inclination to improve productivity or quality, e.g. “quality, productivity, and best-practice issues are someone else’s responsibility”.

This one developer wanted to put the traffic system error codes in a symbol table. Not our problem! Let the testers worry about it.

A person can be held criminally liable if, on a safety critical system, it can be shown that he/she did not follow industry standard practices.
Red lies occur during meetings with clients or management, when representatives make statements about a product or project that are known to be untrue—such as stating that a project’s delivery is on schedule when the team already knows they cannot deliver on time.

“Red Lies” can have extremely serious legal and political repercussions.
Fictionware occurs when an organization or individual promises or contracts to deliver a system for which some agreed-on features are not feasible due to budget, schedule or technology.

And the new version of this car gets 500 miles per gallon, guaranteed!
I don’t see any reason why we have to give the customer that feature. If we do, we will lose money on the project!

But sir, it is in the contract you signed!

“Nondiligence” occurs when important documentation such as requests for proposals, requirements documents, or contracts does not receive a thorough review.
Canceled vacation syndrome arises when managers pressure staff members at the last minute to cancel planned trips or otherwise sacrifice their personal time and possibly money through, for example, nonrefundable trip reservations to meet a short-term deadline.
“Sweep it under the rug” syndrome occurs when unforeseen issues arise that could potentially damage a project or company but, to keep things running smoothly, management and/or staff ignore the issues in the futile hope they will vanish.

The QA staff told me there were 20 “showstopper” bugs.
“Sweep it under the rug” syndrome occurs when unforeseen issues arise that could potentially damage a project or company but, to keep things running smoothly, management and/or staff ignore the issues in the futile hope they will vanish.
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The Software Engineering Code of Ethics and Professional Practice* contains a set of 24 imperatives that deal with professionalism, the interaction between professionals and society, and leadership. The ACM Code of Ethics and Professional Conduct contains a set of 10 imperatives that deal with honesty, responsibility, conflicts of interest, technical competence, and fairness**.

*www.ieee.org/portal/pages/iportals/aboutus/ethics/code.html
**www.acm.org/about/codeofethics

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A large percentage of software professionals do not belong to the IEEE or the ACM.

Many individuals working on projects might not be software professionals, but instead are product or project managers.

Many ACM and IEEE members are unfamiliar with these ethics codes.

Even when somewhat familiar with the imperatives, peer, organizational, or other pressures might be brought to bear.

In some cases, the imperatives are vague and require study to understand when they apply to a particular situation (e.g. “be professional”)
Sample Mitigation strategies

<table>
<thead>
<tr>
<th>Ethical dilemma</th>
<th>Applicable ACM–IEEE imperatives</th>
<th>Comment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mission impossible</td>
<td>Honor contracts, agreements, and assigned responsibilities—“a computing professional has a</td>
<td>The difficulty with honoring agreements and not accepting impossible assignments is that often in the organizational culture acceptance of any assignment is the norm when the assignment comes from a supervisor.</td>
</tr>
<tr>
<td></td>
<td>responsibility to request a change in any assignment that he or she feels cannot be completed as</td>
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<tr>
<td></td>
<td>defined.”</td>
<td></td>
</tr>
<tr>
<td>Mea culpa</td>
<td>Strive to achieve the highest quality, effectiveness, and dignity in both the process and</td>
<td>The imperative is too broad to allow the professional to recognize when it applies in routine situations.</td>
</tr>
<tr>
<td></td>
<td>products of professional work—“The computing professional must strive to achieve quality and</td>
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<td></td>
<td>to be cognizant of the serious negative consequences that may result from a poor quality</td>
<td></td>
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<td></td>
<td>system.”</td>
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<tr>
<td>Rush job</td>
<td>See mea culpa</td>
<td>See mea culpa</td>
</tr>
<tr>
<td>Not my problem</td>
<td>See mea culpa</td>
<td>See mea culpa</td>
</tr>
<tr>
<td>Nondiligence</td>
<td>Give comprehensive and thorough evaluations of computer systems and their impacts, including</td>
<td>Mixed teams of project management, marketing, and sales can make it difficult to achieve this objective, especially if the opinions given do not coincide with senior management’s goals.</td>
</tr>
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<td>possible risks.</td>
<td></td>
</tr>
<tr>
<td>Fictionware/Vaporware</td>
<td>Be honest and trustworthy.</td>
<td></td>
</tr>
<tr>
<td>Canceled vacation</td>
<td>Not covered by the ACM code of ethics. The ACM imperatives deal with fairness and discrimination,</td>
<td>The ACM code deals only with generic fairness and nondiscrimination.</td>
</tr>
<tr>
<td></td>
<td>not the mistreatment of staff.</td>
<td></td>
</tr>
<tr>
<td>Sweep it under the rug</td>
<td>Strive to achieve the highest quality, effectiveness, and dignity in both the process and</td>
<td>Management often resolves problems that occur during construction and testing of software; unfortunately, many managers are unaware of or consider themselves not bound by ACM ethical codes.</td>
</tr>
<tr>
<td></td>
<td>products of professional work; also, honor contracts.</td>
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</tbody>
</table>
Sometimes an individual or organization may engage in practices that go beyond unethical and stray into the outright criminal.

- **Negligent homicide** - The killing of another person through gross negligence or without malice.

- **Reckless endangerment** – Conduct that creates a grave risk of death to another.

- **Depraved indifference** – Behavior that takes the life of another under circumstances that evinced a depraved indifference to human life.

A person behaving unethically may be committing a criminal act without realizing it.

Creating software for a Class II Medical Device and not following standard practice may be construed as criminal behavior if the software causes an injury.
Ethical dilemmas, occurring in series, can magnify a negative outcome.

- Non-diligence. Failure to read the contract carefully.
- Mission Impossible. Schedules imposed to do the work not originally planned for.
- Cancelled Vacation. Brutal Work Schedules
- Rush Job. Just get it done, never mind quality.
- Red Lies. Don’t let the client know.
- Product Late
- Fails Acceptance Tests

Litigation!!

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The advantage of having a name!

Recognizing and mitigating dilemmas can reduce the risk of a negative outcome!

Non-diligence. Failure to read the contract carefully.

Recognize the mistake. Renegotiate the contract.

A successful outcome.

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Mitigating Corporate Strategies

1. Culture
   • A culture of ethical behavior starting at the top

2. Clearly Defined Business Policies
   • Documented and Communicated

3. Constant Monitoring
   • A Corporate Compliance Program

4. Continuous Training
   • A Proactive Training Program
Sample Compliance Program* 

The Siemens Compliance Program anchors compliance in our corporate culture

<table>
<thead>
<tr>
<th>Prevent</th>
<th>Detect</th>
<th>Respond</th>
</tr>
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<tbody>
<tr>
<td>Clear guidelines Siemens Business Conduct Guidelines</td>
<td>Comprehensive control system</td>
<td>Clear consequences</td>
</tr>
<tr>
<td>Training programs</td>
<td>Easily accessible reporting channels “Tell us”</td>
<td>Unequivocal response</td>
</tr>
<tr>
<td>Compliance helpdesk “Ask us”</td>
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Continuous Improvement

Basis for sustainable business success


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Training Examples
Conclusions

- The best way to avoid ethical dilemmas is to have an ethical work environment and culture (Ethical Management)
- Understand and name the dilemmas to prevent and mitigate
- Provide employees with an anonymous mechanism for communicating potential problems (corporate compliance program)
- Empower staff to “push back”
- Training!
Questions?