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Introducing Software Engineering Ethics

LECTURE # 02

How do Computer Related Careers Stack up?

- Licensing and certification.

  - Person may not practice law in state without passing bar exam however, a person can write computer programs and maintain computer systems either as consultants, sole proprietors, or members of large firms.

- Computer professionals might not have direct interaction with their clients, also they are working within teams in large organizations.

Possible Ethical Issues might be in Software Engineering Tasks

Engineering Activities	Possible Ethical Problems
Conceptual design	Blind to new concepts
Preliminary analysis	Overly detailed in designer's area of expertise
Simulation/Prototyping	Testing prototype under most favorable conditions, Incomplete testing
Design specifications	Too tight for accepting any modifications, Design changes not carefully checked
Purchasing	Specifications written to favor one vendor
Quality Control/Testing	Not independent, but controlled by production manager so tests rushed or results falsified

Possible Ethical Issues might be arising in Engineering Tasks

Engineering Activities	Possible Ethical Problems
Advertising	False advertising regarding availability, quality etc
Installation/Training	Subcontracted out, inadequately supervised
Maintenance, parts, repairs	Inadequate supply of spare parts, Hesitation to recall the product when found faulty
Monitoring effects of product	No formal procedures for following life cycle of product, its effect on society and environment
Recycling/disposal	Lack of attention in proper disposal of product, public notice of hazards

Underlying Causes of Ethical Problems

- Lack of vision.

- Incompetence.

- Lack of time or Lack of proper materials.

- A silo mentality.

- The notion that problem will be catched by someone at later stage.
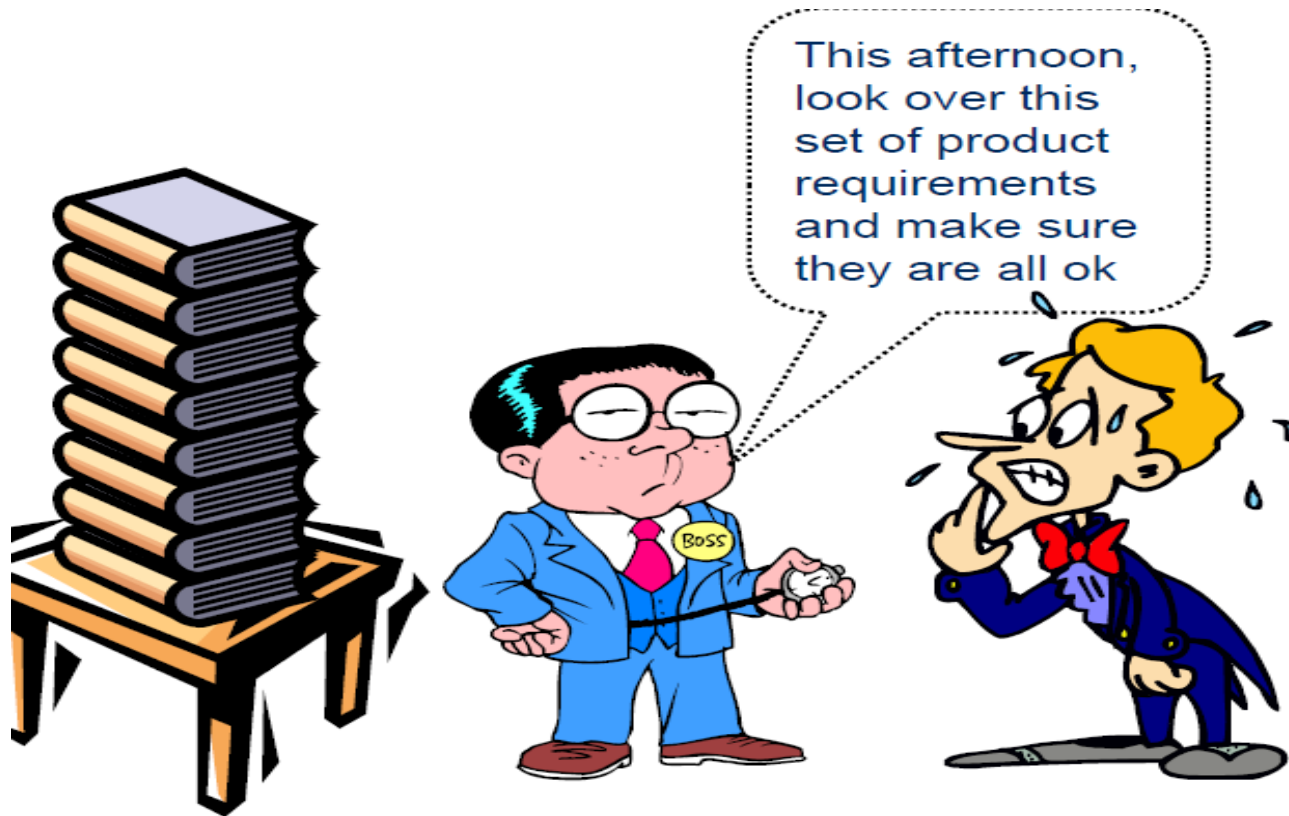
- Dishonesty.

- Inattention.

ANY ETHICAL DILEMMA?

Ethical Dilemmas In Software Engineering

- Mission Impossible.
- Mea Culpa.
- Rush Job.
- Not my problem.
- Red lies.
- Fictionware.
- Non-diligence.
- Canceled Vacation Syndrome.
- Sweep it under the rug.

Mission Impossible

- Mission impossible seems to be a standard practice in certain unhealthy working environments.

- This dilemma occurs when an individual is asked to create or accept a schedule that is obviously impossible to meet without working horrific hours.

Mea Culpa

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

Rush Job

- Intentional delivery of poor quality product trading time for quality.

- For example, a developer working on the software product delivers working code, but the quality of the product is shoddy with little or no documentation at all. The developer might feel under pressure to deliver, becoming more concerned with meeting milestones rather then being concerned about quality.

Not My Problem

- Accepting the development's culture status quo and showing no inclination to improve the productivity or quality.

- Saying, "Quality, productivity and best practice issues is someone else's responsibility".

Red Lies

Red Lies

- Occurs during meetings with clients or managements, when representatives make statements about product or project that are known to be untrue.

- For example, stating that project's delivery is on schedule when team already knows they cannot deliver on time.

Fictionware

Fictionware

- Occurs when an organization or an individual promises or contracts to deliver a system for which some agreed-on features are not feasible due to budget, schedule or technology.

Non-diligence

Non-diligence

- Occurs when important documents like requests for proposals, requirements documents, or contracts does not receive a thorough review.

Canceled Vacation Syndrome

Canceled Vacation Syndrome

- Arises when managers pressurize staff members at the last minute to cancel planned trip or otherwise their personal time and money.

- For example, nonrefundable trip reservations to meet a short-term deadline.
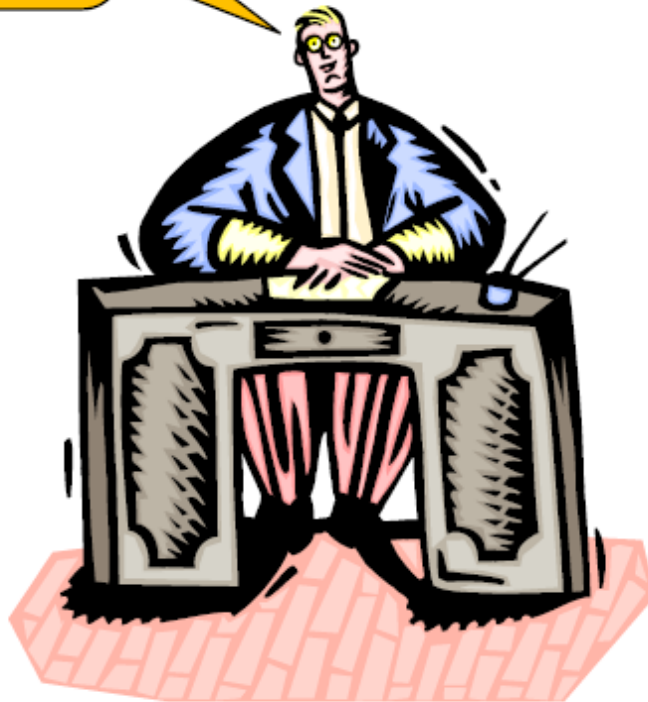
Sweep it under the Rug

Sweep it under the Rug

Sweep it under the Rug
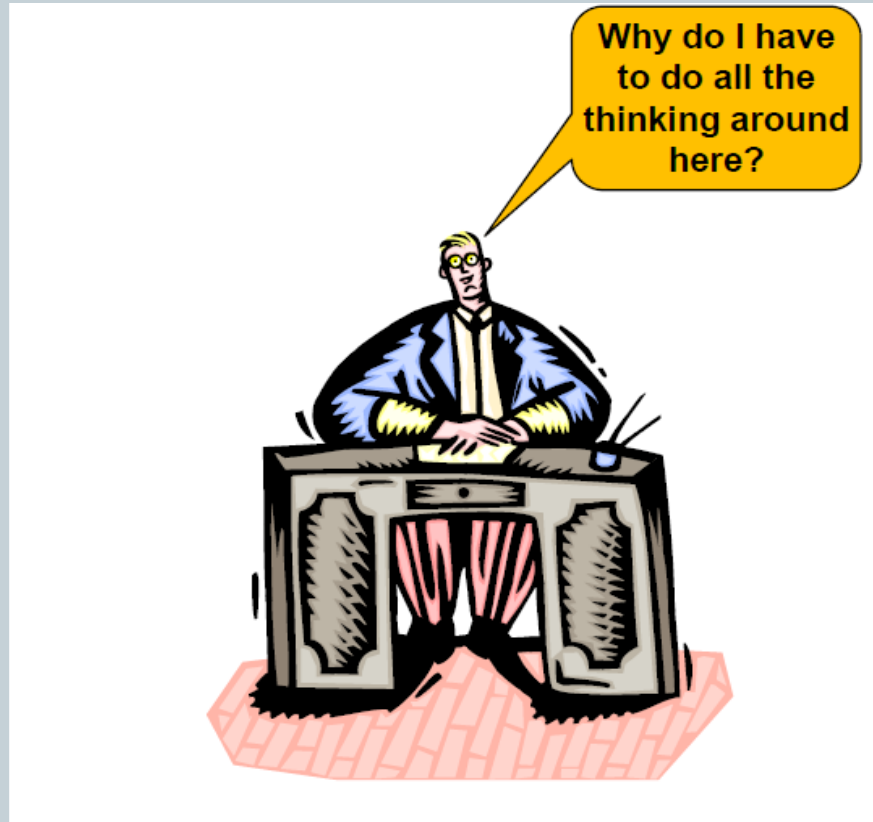
Sweep it under the Bug

Sweep it under the Rug

- Occurs when unforeseen issues arise that could potentially damage a project or company, but to keep things running smoothly, management or staff ignore issues in futile hope that they will vanish.

IEEE and ACM Codes of Ethics

Codes of ethics exist as defined by these professional societies but:

- Large percentage of software professionals do not belong to IEEE or ACM.

- Many ACM and IEEE members themselves may be unfamiliar with these codes.

- Codes are sometimes vague and require study to understand them thoroughly to be applicable to the particular situation.

- Many individuals working on the project are not software professionals but the product or project managers.

SAMPLE MITIGATION STRATEGIES

Ethical dilemma	Applicable ACM-IEEE imperatives	Comment
Mission impossible	Honor contracts, agreements, and assigned responsibilities—"a computing professional has a responsibility to request a change in any assignment that he or she feels cannot be completed as defined."	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.
Mea culpa	Strive to achieve the highest quality, effectiveness, and dignity in both the process and products of professional work—"The computing professional must strive to achieve quality and to be cognizant of the serious negative consequences that may result from a poor quality system."	The imperative is too broad to allow the professional to recognize when it applies in routine situations.
Rush job	See mea culpa	See mea culpa
Not my problem	See mea culpa	See mea culpa
Nondiligence	Give comprehensive and thorough evaluations of computer systems and their impacts, including possible risks.	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.
Fictionware/Vaporware	Be honest and trustworthy.	Honesty and trustworthiness are much more difficult to achieve with organizational dynamics than as an individual. Nonetheless, per the ACM imperatives, there are times when a professional should take a stand or walk away from an assignment.
Canceled vacation	Not covered by the ACM code of ethics. The ACM imperatives deal with fairness and discrimination, not the mistreatment of staff.	The ACM code deals only with generic fairness and nondiscrimination.
Sweep it under the rug	Strive to achieve the highest quality, effectiveness, and dignity in both the process and products of professional work; also, honor contracts.	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.

Criminal versus Unethical Behavior

- Sometimes an individual or organization may get involved into the practices that go beyond the unethical behavior and stray into the outright criminal.

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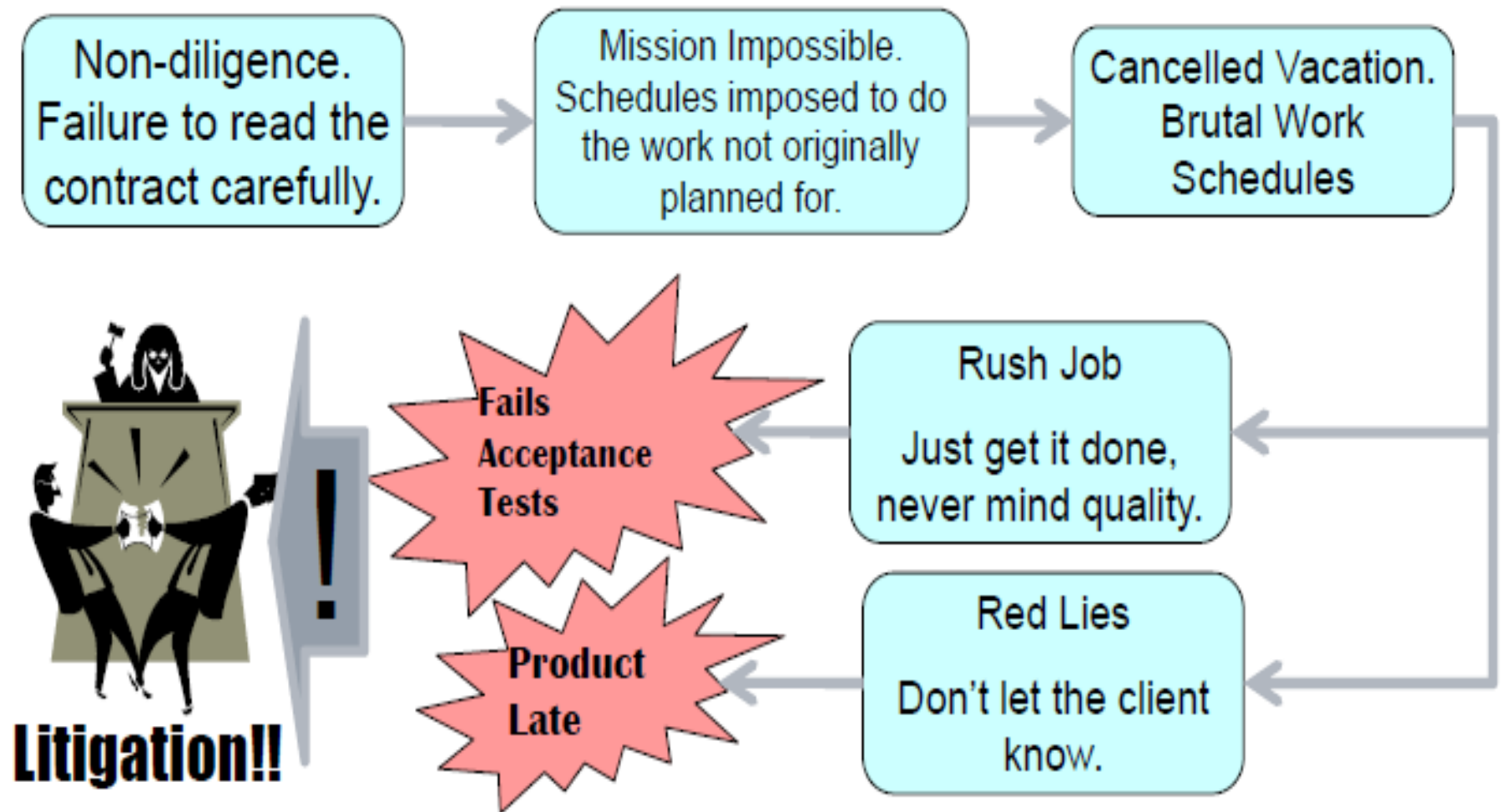
For example

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.

Dilemma Magnification Effect

- Ethical dilemmas, occurring in series, can magnify the 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. → Fails Acceptance Tests / Product Late → Litigation!!

Non-diligence. Failure to read the contract carefully. → Recognize the mistake. Renegotiate the contract. → A successful outcome.

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THE END