Digital Ethics and Data Privacy

Topic 1: Professional Ethics

Case Scenario: Personal Responsibility

- Imagine you are a cybersecurity analyst in a mid-sized corporation.
- One day, while performing a routine security check, you accidentally stumble upon a colleague's personal email left open on a shared computer.
- You notice an email thread with a rival company that suggests your colleague might be sharing sensitive information that could give the rival company a competitive edge.

1. Confront your colleague

   Open communication is best

2. Report to immediate supervisor

   Involve management since potential illegal activities leading to harm to company

3. Gather more information

   Confirm suspicions before potentially harming colleague's reputation

Option 1: Confront Your Colleague

Confront your colleague directly about the email thread.

Pros:

- Direct confrontation could lead to immediate resolution if your colleague can provide a reasonable explanation.
- You show that you are proactive and take potential threats to the company seriously.

Cons:

- If your colleague is indeed guilty, this approach may give them an opportunity to destroy evidence or deny the accusations.
- This action could lead to potential conflict and tension in your working relationship.

Option 2: Report to Superior

Report the incident to your superiors or the relevant department, such as Human Resources.

Pros:

- You fulfill your ethical and professional duty to report potential threats to the company.
- The matter will be handled appropriately and professionally, minimizing potential conflict or bias.

Cons:

- If your suspicions are incorrect, your colleague could face unwarranted scrutiny or disciplinary action, which could harm your relationship with them.
- You may be seen as someone who invades others' privacy if it turns out to be a misunderstanding.

Option 3: Gather More Information

Cautiously gather more information to confirm your suspicions before taking any official action.

Pros:

- This approach might help validate your concerns and provide stronger evidence if you decide to report the situation later.
- It reduces the risk of making accusations based on a misunderstanding or lack of context, thus preventing unnecessary harm to your colleague's reputation.

Cons:

- It could be seen as invading privacy, especially if your actions go beyond what is normally expected in your role as a cybersecurity analyst.
- If your colleague is indeed guilty, the time taken to gather additional information could give them more time to leak sensitive information.

Case Scenario: Professional Ethics

- Imagine you're a software engineer working on a team developing a new mobile application for a healthcare company. The application allows users to input their health data to receive personalized wellness advice.
- One day, while troubleshooting a minor bug, you stumble upon a loophole in the data encryption process that potentially exposes users' health data to hackers.
- The loophole is not obvious, and the chances of someone discovering and exploiting it are low. Fixing it would require a significant amount of time and delay the app's scheduled release.

1. Fix the loophole quietly

2. Inform your team and management

   Propose immediate resolution

3. Document loophole and risks

   Let management decide

Option 1: Fixed Loophole Quietly

Attempt to fix the loophole without reporting it or delaying the release, possibly in your own time or by prioritizing it over other tasks.

Pros:

- If successful, this approach could maintain the release schedule and ensure data security.
- May enhance your reputation as a proactive and dedicated engineer.

Cons:

- Might not be feasible or successful given time constraints, and could result in burnout or errors elsewhere due to divided attention.
- Doesn't foster a culture of transparency and teamwork if issues aren't reported and addressed collectively. It could also cause trouble if your superiors find out later that there was a problem you didn't report.

Option 2: Inform Management

Report the loophole to superiors and suggest postponing the release until the loophole is fixed.

Pros:

- Ensures that user data is secure and maintains trust in the application and company.
- Aligns with professional ethical obligations to prioritize user safety and data privacy.

Cons:

- Likely to delay the release of the application.
- May require additional resources and increase development costs.

Option 3: Let Management Decide

Document the loophole and potential risks, and let management make an informed decision.

Pros:

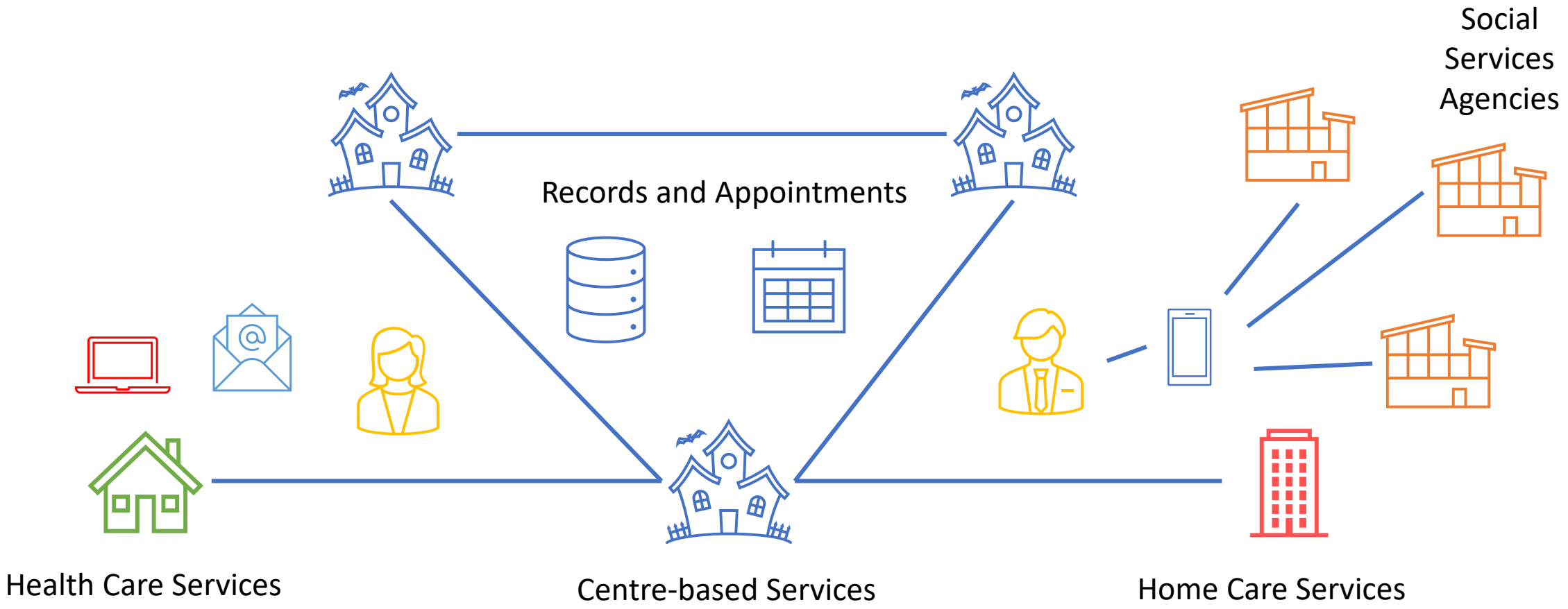
- Allows for a collective decision-making process involving those with the broadest perspective on company strategy and risk tolerance.
- The burden of decision is not solely on you, reducing personal risk.
- Promotes transparency and clear communication within the organization.

Cons:

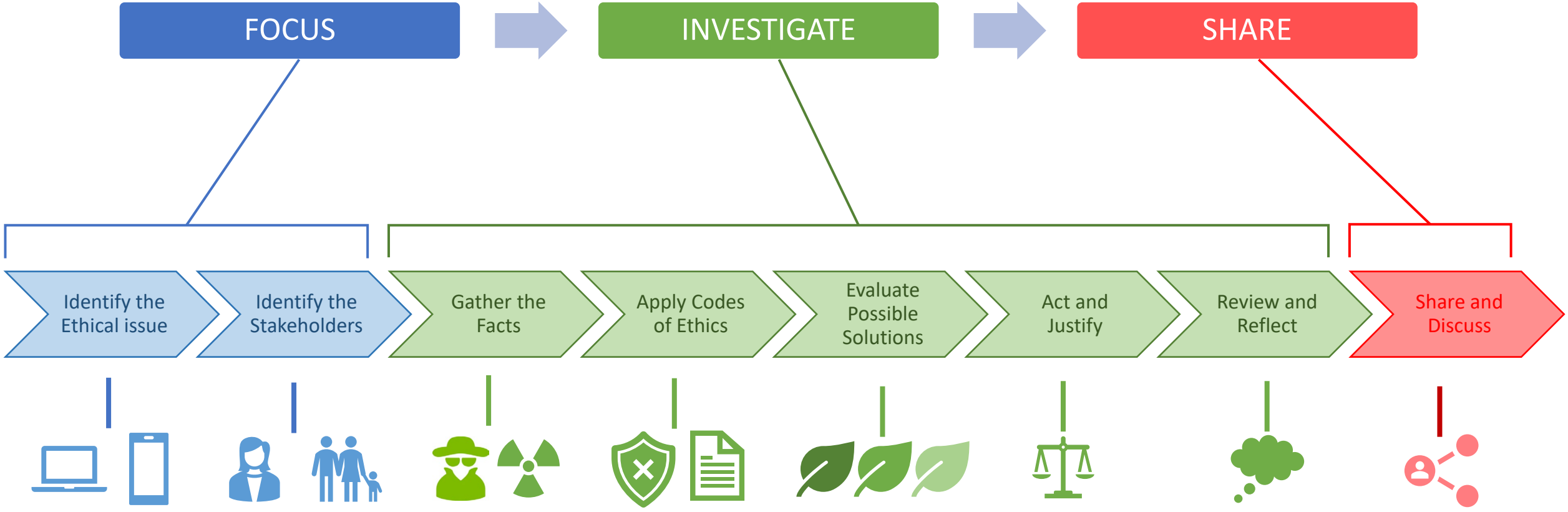
- It may still result in the decision to proceed with the launch if management deems the risk acceptable, potentially placing user data at risk.
- Management, depending on their technical understanding, may not fully grasp the potential severity of the loophole, leading to an uninformed decision.

Case Scenario 0: Community Service Centre

- To develop an online system for computerized record and appointment for their clients for a community service centre.

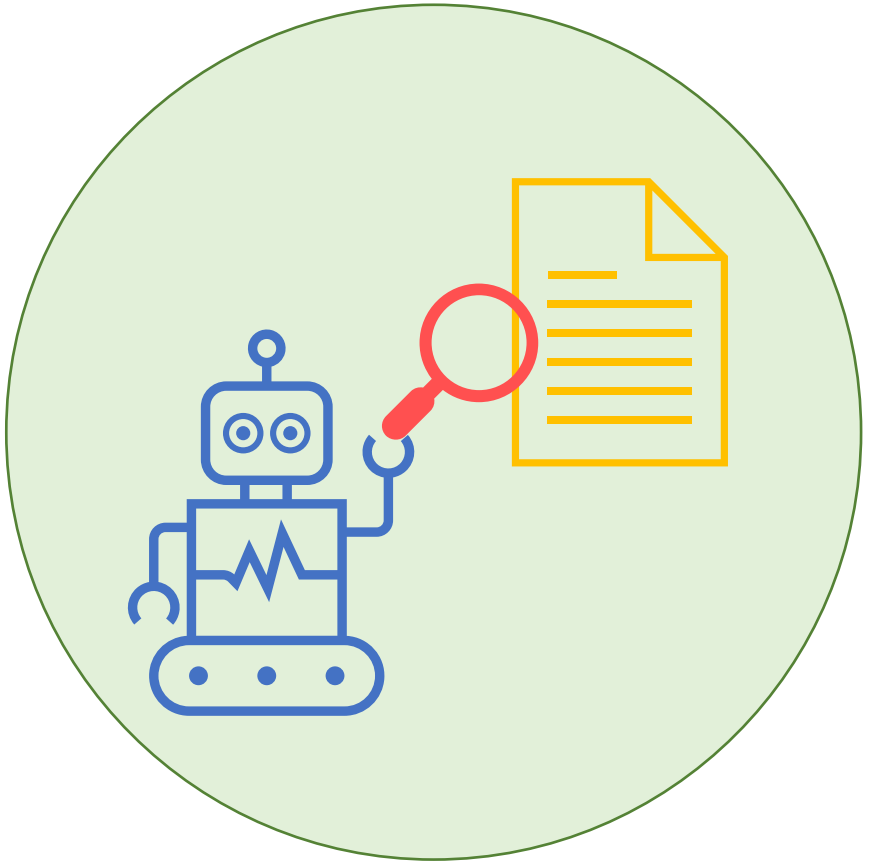


Using the FISh Framework



Case Scenario 1: AES

- A large university is exploring the use of an **Automated Essay Scoring** (**AES**) System, which employs computer technology of evaluating and scoring written assignments. It uses Natural Language Processing (NLP), a form of artificial intelligence that allows computer to comprehend and manipulate human language.
- Suppose you are the Dean of the School of Computing who must decide whether to use such a system. Analyze the decision as both an ethical and practical problem. Discuss potential benefits and problems or risks of using the system.



AES: Role Sheet

Team #	Stakeholder	Role Sheet
1	**Students**: As the end-users of this system, they can discuss the implications of AES on their learning experience, peer interaction, and stress levels.	**Role Sheet Questions**: • How do you feel about your essays being graded by an algorithm? • What are the potential benefits and drawbacks for students? • How could an AES system impact your learning and writing skills? • How does this change the dynamics of the teacher-student relationship?
2	**Instructors and Teaching Assistants**: They represent the staff who will use the system to grade essays. They can discuss the impact of the system on their workload, job satisfaction, and relationship with students.	**Role Sheet Questions**: • How will this system impact your workload and time spent grading? • Can an AES system provide the same level of depth and nuance in feedback as a human grader? • How does this impact your relationship and interaction with students?

Role Sheet

Team #	Stakeholder	Role Sheet
3	**School Administration**: They have to consider the financial cost, the reputation of the institution, and potential backlash from both teachers and students.	**Role Sheet Questions**: • How does implementing AES align with the educational mission of the institution? • What are the potential financial implications of implementing an AES system? • How might AES implementation impact the school's reputation?
4	**Parents**: They are concerned about their children's education and the quality of feedback their children will receive.	**Role Sheet Questions**: • How do you feel about the use of AES in your child's education? • Do you believe an AES system could adequately evaluate your child's writing skills? • What concerns do you have about your child's learning with an AES system?

Role Sheet

Team #	Stakeholder	Role Sheet
5	**Software Developers and AI Researchers**: They have the responsibility to ensure the system works as intended without bias and with maximum effectiveness.	**Role Sheet Questions**: • How can you ensure the AES system is unbiased and effective? • What measures can be taken to improve the system based on user feedback? • How can novel ideas and concepts be assessed fairly? • What are the ethical considerations you need to account for in developing an AES?

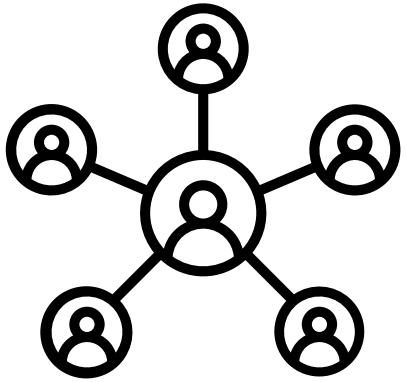
Read, Watch and Do (RWD)

Topic Objectives

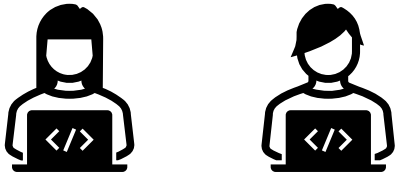
- Understand the importance and principles of professional ethics in the field of computing.
- Identify and articulate core ethical principles for computing professionals.
- Analyze the ACM Code of Ethics and Professional Conduct.
- Identify and discuss a computing professional's ethical obligations to customers, employers, other professionals, and the public.
- Outline the process, focus, conduct and motivation of ethical decision-making in common ethical frameworks.
- Use an Ethical Decision-Making Framework to assess a complex ethical dilemma and make ethical judgements about it.

What is Professional Ethics?

- Professional ethics are principles that people use in their jobs.

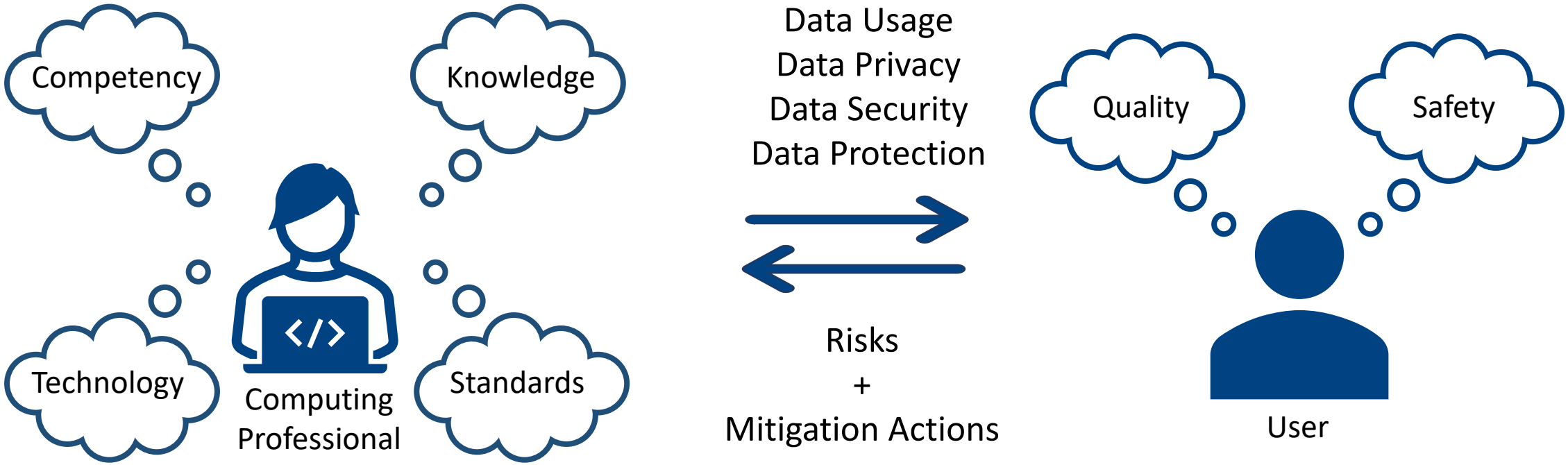


Relationships with and responsibilities toward customers, employees, employers, and other people who use one's products and services, and others whom one's products affect.



Guidelines related to actions and decisions of individuals who create and use computing systems.

Ethical Guidelines for Computing Professionals



Application for Computing Profession

Area	Application
Software Development	• Ensure code is robust, secure, and free from any form of intentional harm (like malware)
Data Management	• Respect and uphold data privacy, acquiring user data only when necessary and with consent, storing it securely, and using it responsibly.
AI and machine learning	• Prevent the development and deployment of biased or discriminatory algorithms. • Strive for transparency in their operations, recognizing the importance of accountability in their profession.
computing students	• Maintain academic honesty, such as not plagiarizing code or misrepresenting work during studies.

Responsibility in Computing Profession

Responsibility Towards	Ethical Issues
Customers and Users	• Social Impact • Quality and Risks • Data Privacy
Employers	• Intellectual Property • Conflict of Interest
Other Professionals	• Plagiarism • Professional Standards • Mentorship
Public	• Safety, Health, Welfare • Whistle-blowing

Source: Ethics and Professional Responsibility in Computing

Professional Codes of Ethics

- Professional ethics are often codified as a set of rules, such as a professional code of conduct, which is underpinned by a set of ethical principles.
- Typical ethical principles include:
  - Honesty
  - Trustworthiness
  - Loyalty
  - Respect for others
  - Adherence to the law
  - Doing good and avoiding harm to others
  - Accountability

Professional Codes of Ethics

- ACM Code of Ethics and Professional Conduct
- Software Engineering Code of Ethics
- Professional Practice
- The Codes emphasize the basic ethical values of honesty and fairness, and areas that are particularly vulnerable from computer systems

Association for Computing Machinery

Personal Responsibility

- Admitting to a customer that your program is faulty,
- Declining a job for which you are not qualified, or
- Speaking out when you see someone else doing something wrong

Issues Faced In Computing Profession

- How much risk (to privacy, security, safety) is acceptable in a system?
- What uses of another company's intellectual property are acceptable?
- And many more…

Further Reading

1. ACM Code of Ethics and Professional Conduct

https://www.acm.org/code-of-ethics

2. IEEE Code of Ethics

https://www.computer.org/education/code-of-ethics

3. Professional Ethics: Professionalism And Skills

https://harappa.education/harappa-diaries/professional-ethics-and-professionalism/

4. 5 examples of ethical issues in software development

https://www.techtarget.com/searchsoftwarequality/tip/5-examples-of-ethical-issues-in-software-development

5. Integrating social responsibility into product development

https://www.mindtheproduct.com/social-responsibility-into-product/

6. Incorporating Ethical Considerations into the Design Process

https://incompliancemag.com/incorporating-ethical-considerations-into-the-design-process/

Q & A


NUS
National University
of Singapore
School of
Computing