

Social, Ethical, Legal and Economic Issues of Computing

☰ Chapter No.	34
▼ Status	Completed

▼ Association for Computing Machinery (ACM) Code of Ethics

▼ Any code of ethics, including this one, is **not a look-up table** that prescribes a certain action in a given situation

- Rather, it is a set of **fundamental principles**
- They advocate that a professional software engineer should make an **ethical judgement** based on **thoughtful considerations of these principles**
- It is difficult to apply '**a one-size-fits-all**' guiding principle to all possible scenarios that a software engineer might face

▼ Eight Principles Defined in the ACM Code of Ethics

1. **Public** - Software engineers shall act consistently with 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. **Judgement** - Software engineers shall maintain integrity and independence in their professional judgement
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 and ethical approach to the practice of the profession

▼ Legal Frameworks (in Singapore)

- The **Computer Misuse Act** covers, among other things, hacking, sabotaging computers, accessing and distributing confidential data, copyright infringement including installing and distributing pirated software, cyber-stalking, harassment or online grooming, and credit card fraud.
- The **Cybersecurity Act** establishes a legal framework for oversight and maintenance of national cybersecurity, including establishing a cybersecurity regulator, imposing cybersecurity obligation on organisations providing critical and essential services, licensing and regulating cybersecurity service providers, and providing a framework for sharing cybersecurity information
- The **Personal Data Protection Act (PDPA)** covers the collection, use, disclosure and care of personal data

▼ Ownership & Copyright

▼ **Copyright** is a formal recognition of ownership

- If a person creates and publishes some work that has **some element of originality**, that person becomes the **owner** and can **claim copyright**
- An exception is if the person **works for an organisation**, as an organisation can claim copyright for published work created by one or more people **working for the organisation**

▼ Copyright can apply to any of the following:

- Literary work
- Musical composition

- Film
- Music recording
- Radio or TV broadcast
- Works of art
- Computer programs
- Copyright **cannot apply to an idea**, and it cannot be claimed on **any part of a published work** that was **previously published by a different person or organisation**

▼ Two Reasons Why Copyright Law Exists

- Creative work takes **time and effort** and requires **original thinking**, so the creator deserves the **opportunity to earn money** from it
- It is **unfair** for another person or organisation to **reproduce the work and make money** from it **without paying the original creator**

▼ Software Licensing

▼ **Commercial software** is no different from any other commercial product, in the sense that it is created and sold by a company to **make a profit**

- However, the key difference is that even if you buy software, you **do not own the software**
- Instead, you are only **buying a license** that **allows you to use the software**

▼ **Shareware** is commercial software which is made available on trial basis for a limited time

- During this trial period, either the full version, a limited version or a beta test of a new version might be available

▼ **Freeware** does not have a time limit on the free usage

- It could be the full software or an earlier version

▼ **Open-source software** is a type of computer software in which source code is released under a license in which the copyright holder grants

users the rights to use, study, change, and distribute the software to anyone and for any purpose

- The philosophy here is that using open-source software will allow [collaborative development of software](#) to take place
- Open-source software is [normally](#) available [free-of-charge](#)

▼ Impact of Computing & Technology

▼ Social Impacts

- Allowing people who are [physically distant](#) to [communicate](#) with one another easily and immediately
- Allows people to [access information far more easily and quickly](#) than traditional methods
- Allows for [collaboration](#) between teams which are [geographically separated](#)
- [Artificial intelligence](#) helps with [data analysis](#), such as predicting where crimes are likely to take place, which can help governing authorities to more efficiently prevent and respond to crime

▼ Ethical Impacts

- Programming [self-driving vehicles](#) to [make decisions when an accident is imminent](#) leads to [ethical dilemmas](#), such as whether the car should prioritise the driver's life or the pedestrian's
- [Artificial intelligence](#) tends to [exaggerate the human biases present in training data](#), which could lead to [even more biases](#) in the artificial intelligence's [decision making](#)

▼ Legal Impacts

- [Creation of laws](#) pertaining to [cybersecurity and data collection and protection](#)
- Modification of [copyright laws](#)
- [Current laws](#) may be [unequipped to handle artificial intelligence](#)

▼ Economic Impacts

- Automation of repetitive tasks leads to cost savings for organisations, but also results in job losses
- Creation of new technology-related jobs in existing companies