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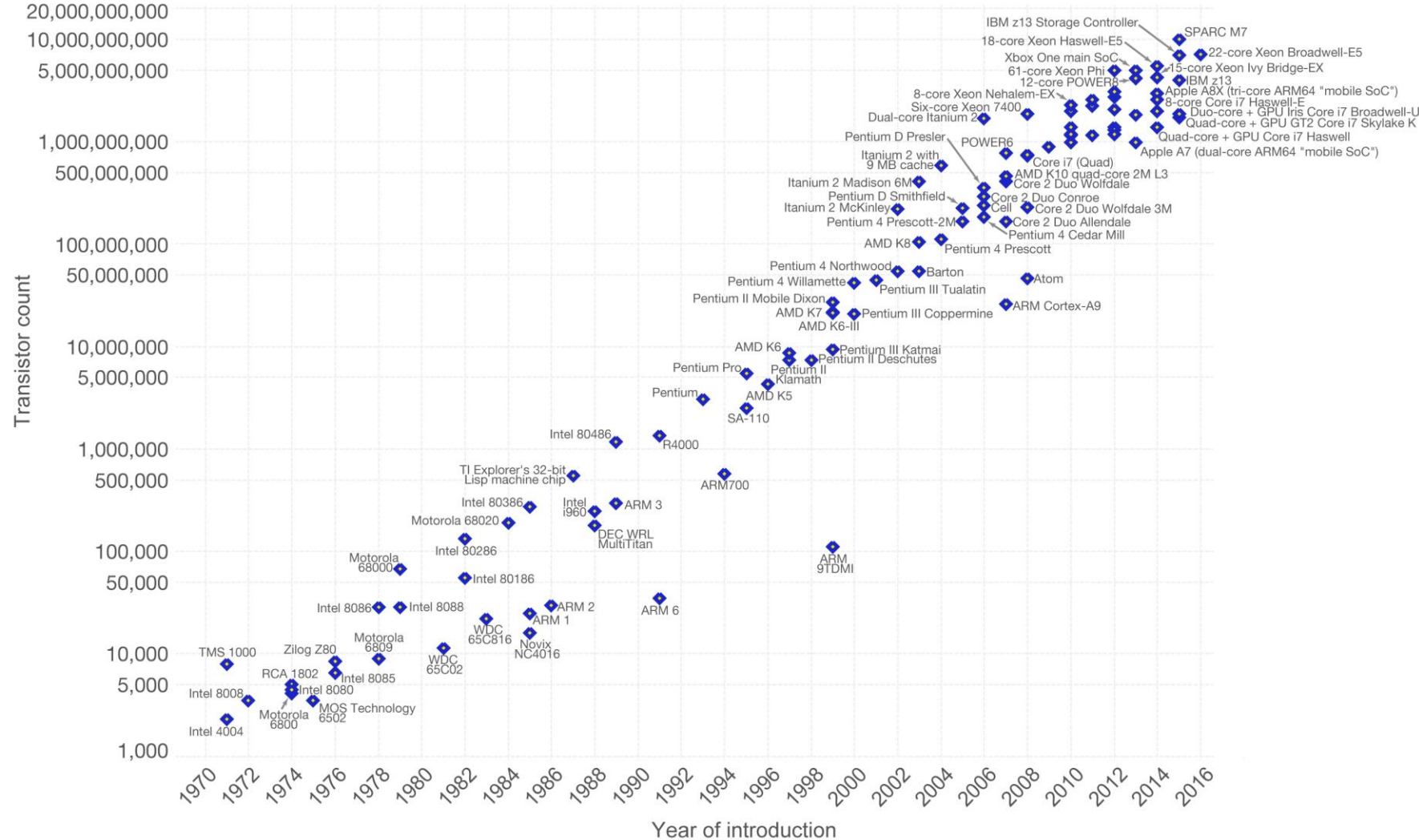
Etika Digital

Dr. Eng. Niki Prastomo

08/06/2023

Moore's Law – The number of transistors on integrated circuit chips (1971-2016)

Moore's law describes the empirical regularity that the number of transistors on integrated circuits doubles approximately every two years. This advancement is important as other aspects of technological progress – such as processing speed or the price of electronic products – are strongly linked to Moore's law.

Data source: Wikipedia (https://en.wikipedia.org/wiki/Transistor_count)
The data visualization is available at OurWorldinData.org. There you find more visualizations and research on this topic.

Licensed under CC-BY-SA by the author Max Roser.
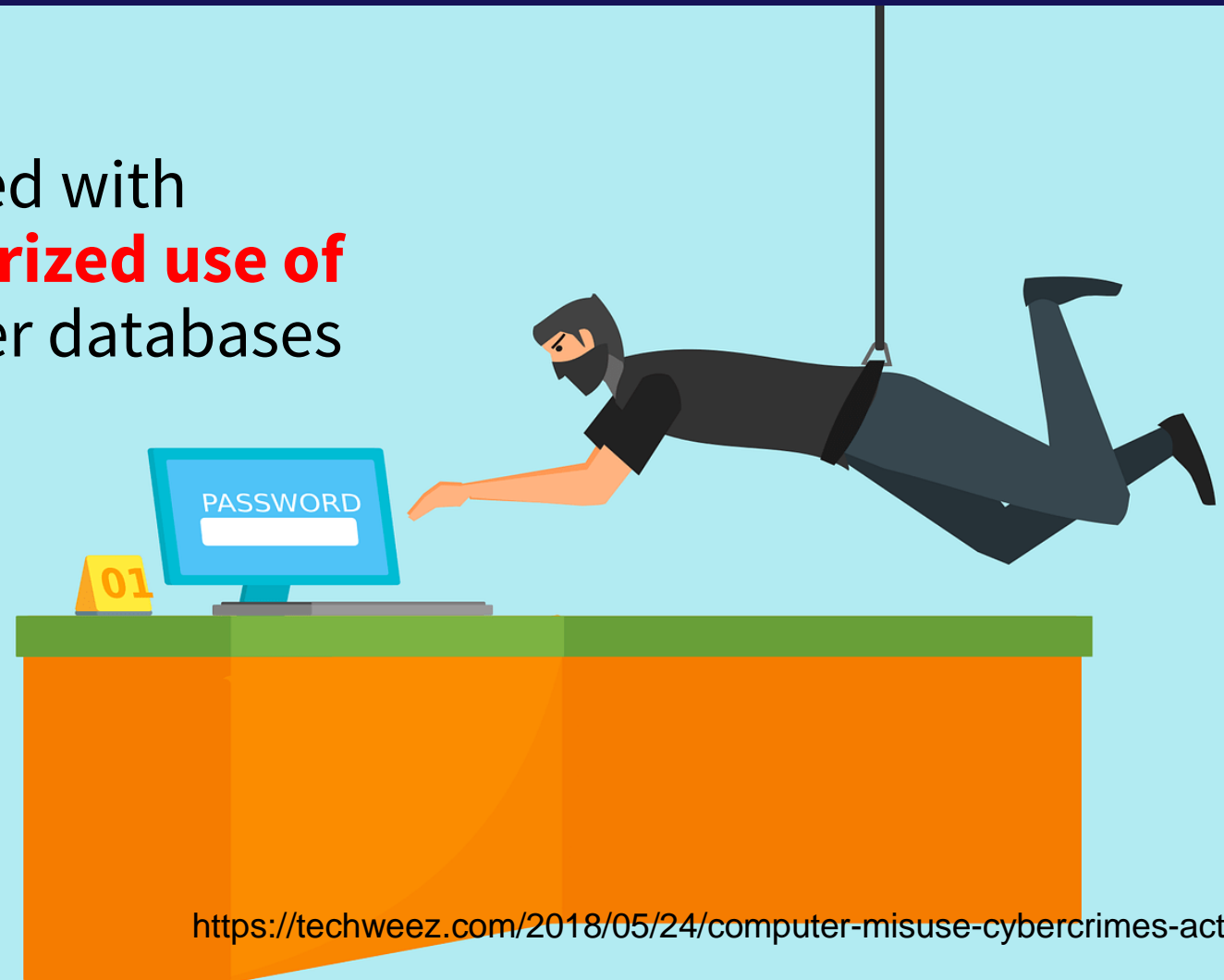
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Unfortunately, there are also numerous ways in which computers have been **misused**, leading to **serious ethical issues**. The engineer's roles as designer, manager, and user of computers bring with them a responsibility to help foster the ethical use of computers.

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

Etika Rekayasa

Many ethical problems associated with computer use relate to **unauthorized use of information stored** on computer databases and are thus related to the issues of **confidentiality** and **proprietary information**.

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

https://techweez.com/2018/05/24/computer-misuse-cybercrimes-act/

There are two broad categories of computer ethics problems:

- Those in which the computer is **used to commit an unethical act**, such as the use of a computer to hack into a database, and

- Those in which the computer is used as an engineering tool, but is **used improperly**.

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

Etika Rekayasa

A. COMPUTERS AS A TOOL FOR UNETHICAL BEHAVIOR

Computers can be used to more efficiently steal money from a bank.

Computers can be used to make bank robbery **easier to perform** and **harder to be detected and traced**.

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

Etika Rekayasa

Information Privacy

By privacy, mean the basic right of an individual to control access to and use of information about himself. Why is privacy an ethical issue? Invasions of privacy can be harmful to an individual in two ways.
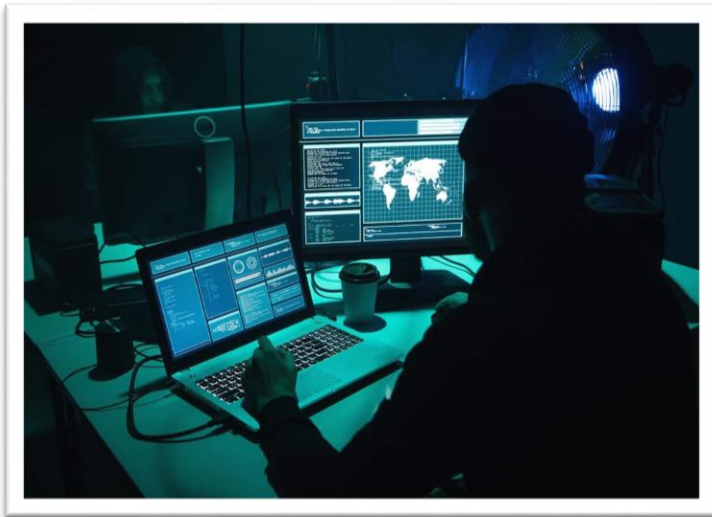
- First, the **leaking of private information** can lead to an individual's being **harassed** or **blackmailed**.

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

- Second, personal information can also be considered **personal property**. As such, any unauthorized use of this information is **theft**.

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)
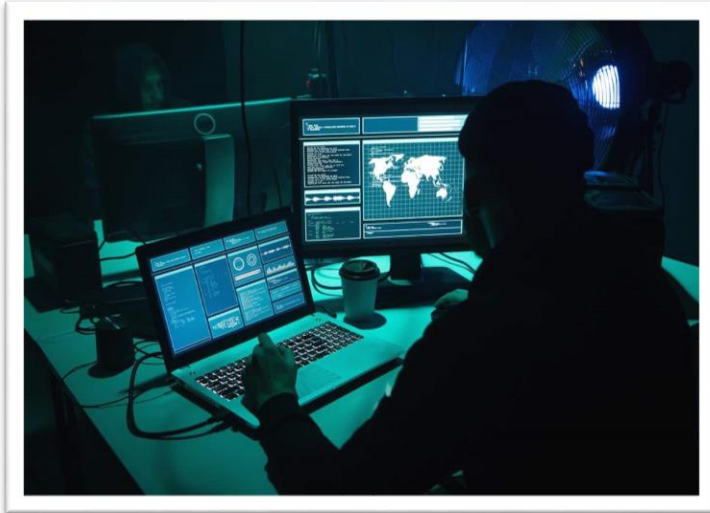
A. COMPUTERS AS A TOOL FOR UNETHICAL BEHAVIOR

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

Computer hacking is clearly **ethically troublesome**. As mentioned before, accessing private information violates the privacy rights of individuals or corporations, even if the hacker keeps this information to himself.

In extreme cases, hackers have accessed secret military information, which has obvious implications for national security.

A. COMPUTERS AS A TOOL FOR UNETHICAL BEHAVIOR

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

The **issuance/making of computer viruses** is also **unethical**. These viruses frequently destroy data stored on computers. In extreme cases, this act could lead to deaths when hospital records or equipment are compromised, to financial ruin for individuals whose records are wiped out, or even to the loss of millions of dollars for corporations, individuals, and taxpayers, as completed work must be redone after being destroyed by a virus.

Etika Rekayasa

A. COMPUTERS AS A TOOL FOR UNETHICAL BEHAVIOR

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

Copyright infringement is also a concern in computer ethics. Computers and the Internet have made it easy to share music, movies, software, and other copyrighted

materials.

Briefly, copyright exists **to protect the rights** of authors, musicians, and others to profit from their creations.
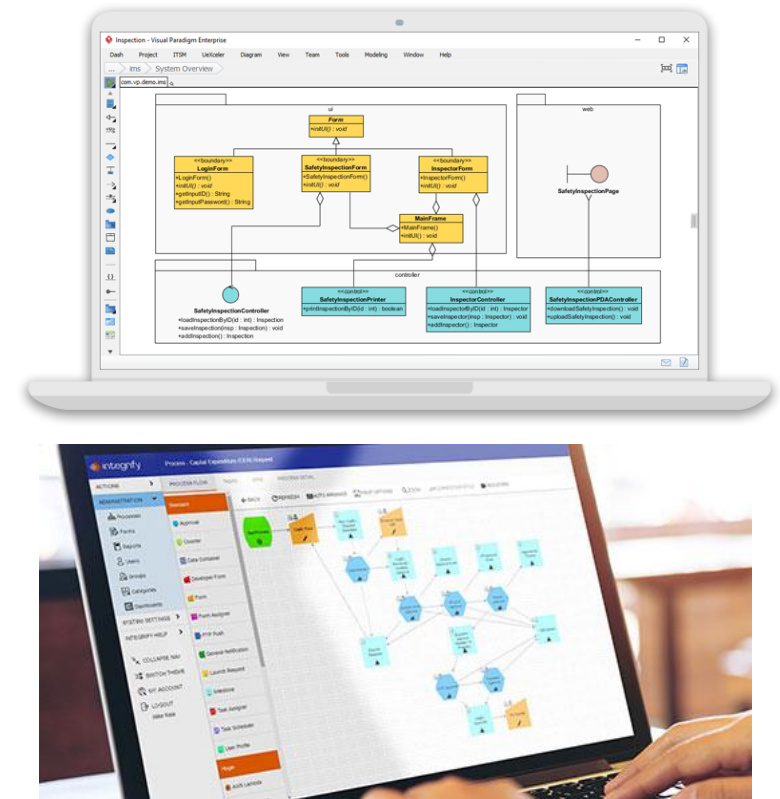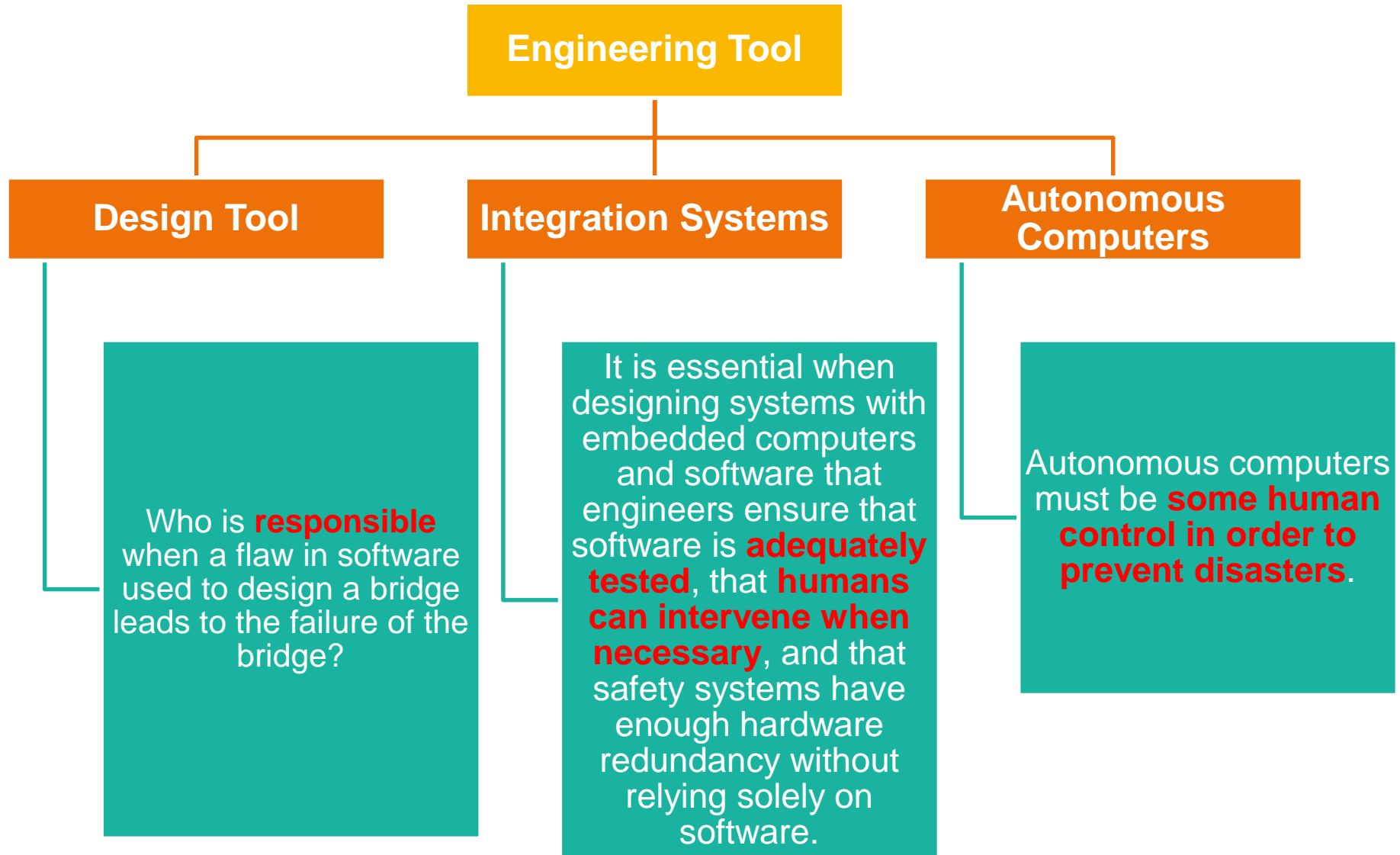
B. COMPUTERS AS AN ENGINEERING TOOL

The use of software is not unique to engineering, they are useful in various areas of business.

Unique to engineering are two uses of computers:

- as **design tools** and

- as **components** integrated into engineered systems.

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

Engineering Tool

Design Tool

Integration Systems

Autonomous Computers

Who is **responsible** when a flaw in software used to design a bridge leads to the failure of the bridge?

It is essential when designing systems with embedded computers and software that engineers ensure that software is **adequately tested**, that **humans can intervene when necessary**, and that safety systems have enough hardware redundancy without relying solely on software.

Autonomous computers must be **some human control in order to prevent disasters**.

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

Computer Codes of Ethics: To aid with decision making regarding these and other computer-related ethics issues

IEEE Computer Society
SOFTWARE ENGINEERING CODE OF ETHICS ANDPROFESSIONAL PRACTICE, short version

1. **PUBLIC -** Software engineers shall act consistently with the public interest.
2. **CLIENT AND EMPLOYER** - Software engineers shall act in amanner that is in the best interests of their client and employer, consistent with the public interest.
3. **PRODUCT -** Software engineers shall ensure that their productsand related modifications meet the highest professional standards possible.
4. **JUDGMENT -** Software engineers shall maintain integrity and independence in their professional judgment.

Charless B. Fleddermann, Engineering Ethics 4th Edition (2012)

Thank You

Etika Rekayasa