

Ch 5 Risk and Responsibility

Date _____
Page _____

Accuracy vs Democracy has been raising concern in the ~~Deo~~ internet. Which faction would you prefer? Put your views.

Accuracy → Choosing the most correct, evidence-based, expert-driven decision, even if only a few people decide.

Democracy → Choosing based on the majority's opinion, even if it might be less technically accurate.

I would prefer Accuracy when the issue directly affect safety, science or technical correctness - but I support Democracy in matter of values, laws & public rights. Without accuracy, democracy can spread wrong info. Without democracy, accuracy can become biased & controlled by few. Accuracy ensure truth while democracy ensure fairness and representation. Both are important but their priority depends on context.

Eg: Controlling Misinformation on social media.

Democracy approach:

A platform allows users to vote on whether a post is true or false. If the majority believe it's true, it stays online - even if it's actually false.

Risk: Misinfo can spread if the majority are misinformed themselves.

Accuracy approach:

The platform uses fact-checker and AI-model trained on verified sources to determine whether the post is accurate, removing it if false - even if most users disagree.

Benefit: Reduce harmful misinformation & protect truth.

Accuracy gives correct result and democracy gives fair representation. On the internet accuracy is important to stop false info while democracy is important to keep freedom of public voice.

The best way is to balance both.

Software risk are considered critical in case of life critical system as the developer is the only one to blame if an accident occurs! Do you agree or disagree? justify your opinion.

→ I agree.

In a life critical system (like medical devices, aircraft control software, nuclear plant monitoring) even a small software failure can cause loss of life.

Developers are responsible for ensuring the code is safe, tested & meets all standards because their work directly affects human safety.



Eg: Autonomous Vehicles

In selfdriving cars, software control braking, steering & obstacles detection. If the software fails to detect obstacles or misinterpretes sensor data, it can cause accident, injuries.

Developers responsibility:

Developers must ensure the software is thoroughly tested under all condition including rare scenarios like sudden obstacles or bad weather. If a software bug causes a crash, the developers are responsible because their code directly control the vehicles safety.

why critical?

Unlike human drivers, the car relies fully on the software. Any flaw on algorithm or sensor interpretation can lead to life threatening situations.

Safety-Critical system

→ is any system (usually software & hardware together) where failure or malfunction can cause serious harm to people, the environment or the property.

Eg: Airplane control system

Medical device like pacemakers

Value-Centred Design

→ VCD is an approach to creating technology or system that focus on human value like privacy, fairness, security and accessibility. Instead of just making something that work well or look good, this method makes sure that product respect what users care about and what society find important.

Eg: when designing a social media app, value-centred design could mean building feature that protect user privacy and prevent harassment, not just focusing on getting more user or likes.

Responsibility

Having a duty to complete a task or role. It's about the job or work you are expected to do.

Eg: Software developer are responsible for writing bug free code.

Accountability

Being answerable for the outcome of a task or decision. It means you must justify or explain what happen.

Eg: If bug cause failure, then developer is accountable & must explain why.

Computer liabilities

Being legal responsible for problem caused by computer or software. Eg: If a company release

faulty antivirus software that fail to protect user's computer & cause data loss, the company can be held legal for damages.

Hardware design issue

A hardware design issue happen when there is a problem or flaw in the physical component or circuit of a computer system. These issue can cause the hardware to not work properly or fail completely.

e.g.: If a smartphone battery overheated because of a design mistake in the power circuit, that is a hardware design issue.



How risk in critical system can be minimized?

Discuss with example

1) Through testing

Test the system carefully under all possible conditions to find and fix errors before use.

Eg: Pilot and engineers run simulations of all flight scenarios to check software & hardware.

2) Redundancy

Use backup system that take over if the main part fails. Eg: Multiple backup system for flight control ensure the plane can still fly if one system fails.

3) Fail-safe Design

Design the system so that if something goes wrong it fails in a safe way without causing harm.

Eg: If system detect fault, it switch to safe mode or alert the pilot to take control.

4. Regular Maintenance

Keep the system updated and well-maintained to prevent unexpected failures.

5) Strict Standards and Regulations

Follow industry safety standards & legal regulation to ensure quality & safety.

6. Training and Procedures

Make sure operators and users are well-trained to handle the system correctly. Eg: Pilot are trained to respond quickly in emergencies.