Ethical Issues and Concerns in Digital Innovation

ISM-E2002

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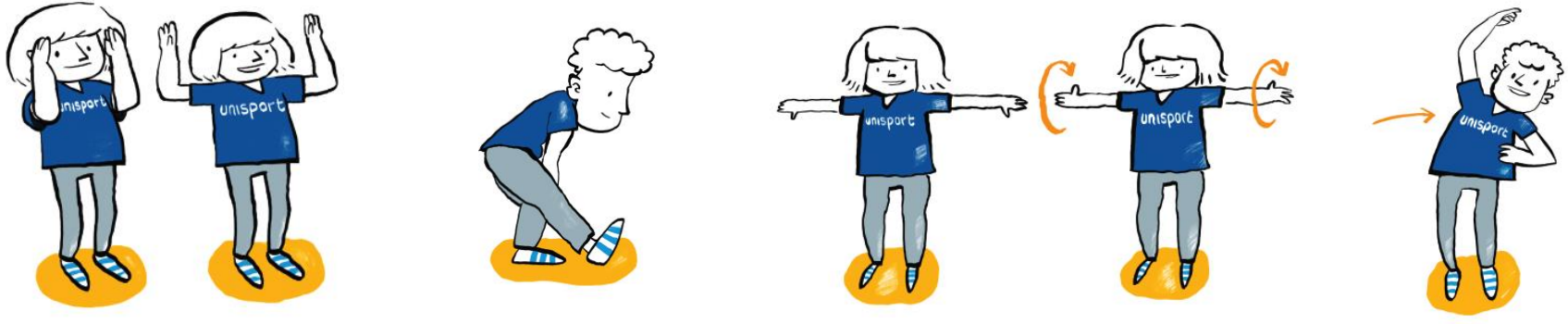
Feel free to move during the lecture

Taking breaks, for example with break exercise or just moving around, improves the ability to focus, which improves the ability to study and learn.

- Students wish more breaks and physical activity during lectures!



Session 3 – Ethics in Designing Digital Services

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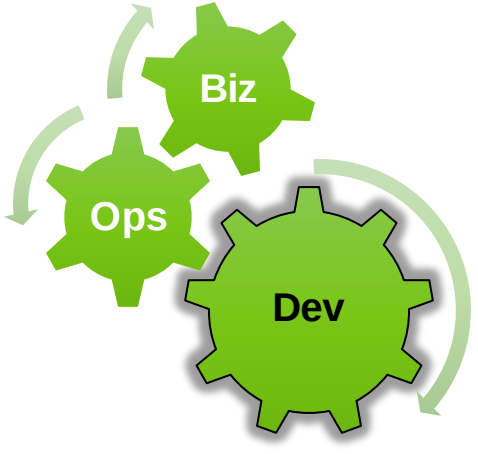
What is Digital Innovation?

Digital innovation refers to the use of digital technologies for the creation of, and consequent changes, in market offerings and business processes or models [1].

- IT-enabled organisations use IT as a support function for creating and delivering value via non-digital products & services [2].
- Digital organisations have a digital artefact at the core of their business; they provide digitally-enabled products and market offerings [2].

Digital artefacts (i.e. software and data) have become the fundamental elements and necessary ingredients of innovation in modern societies [3].



1- Nambisan et al., 2017
2- Carroll et al., 2023
3- Yoo et al., 2010

Digitalisation and Socio-Ethical Issues

In digital societies citizens are a part of data value chains, where their behaviour is constantly measured, profiled, and manipulated (e.g. by digital platforms and recommender systems).

"Technological dream" provides citizens with a hopeful narrative, in which technological progress leads to societal progress [1].

- This instrumental vision leads to organised irresponsibility.

Topic	Example of societal & ethical issues caused by digitalisation (Kool et al., 2017 as cited in [1])
Privacy	Data protection, privacy, mental privacy, surveillance
Security	Cyber & physical security, identity fraud
Autonomy	Freedom of choice & expression, manipulation, paternalism, skills
Control over technology	Control over & understanding of AI, responsibility, predictability
Human dignity	Dehumanisation, de-skilling, de-socialisation, unemployment
Justice	Discrimination, exclusion, equal treatment, stigmatisation
Power structures	Unfair competition, exploitation, consumer-business relations, business-platform relations

1- Van Est, 2019

ISD as a Socio-Technical Phenomenon

The more we rely on digital services the more they and their underlying design decisions influence our daily lives.

- Any design decision made while developing digital artefacts has a set of ethical, legal, societal and environmental responsibilities [1].

ISD has societal implications thus ethical concerns such as justice and fairness cannot be ignored [2].

- Traditional approaches to ISD have certain assumptions that compromise fairness.

1- Becker et al., 2015
2- Chatterjee et al., 2009

Ethics and IS Development

Codes of Conduct

Codes of Ethics and Codes of Conduct, published by different institutes such as IEEE, ACM, AIS, provide ethical guidance to professionals who need to make design decisions to develop and implement digital solutions.

"The Code as a whole is concerned with how fundamental ethical principles apply to a computing professional's conduct. ***The Code is not an algorithm for solving ethical problems****; rather it serves as a basis for ethical decision-making. When thinking through a particular issue, a computing professional may find that* ***multiple principles should be taken into account****, and that different principles will have different relevance to the issue. Questions related to these kinds of issues can best be answered by* ***thoughtful consideration of the fundamental ethical principles****, understanding that* ***the public good is the paramount consideration****. The entire computing profession benefits when the ethical decision-making process is accountable to and transparent to all stakeholders."*

- AIS Code of Ethics and Professional Conduct

Examples of ethical dilemmas

Transparency vs. Privacy

- What kind of information and how much details should log files contain? How long should we keep records of users actions?

Security vs. Autonomy

- How much protection and monitoring should be implemented in a service? Should we add backdoors to catch the “bad guys”?

Power structures vs. Control over Technology

- How bullet proof should the code be? How should we decide if a bug is serious enough to be fixed? How can we prioritize and fix bugs fairly?

Functionalist approaches to ISD

Historically, ISD has been undertaken by following methodical engineering-oriented approaches belonging to functionalist paradigm [1].

Functionalist approaches focus on the application of software engineering principles to develop systems in a manageable, predictable, and disciplined manner.

Assumption	Description of the assumptions adapted from [1]
Control	ISD is a process that is managed and controlled. It pre-supposes management control over developers and users.
Social Integration	ISD is an orderly process where social integration, in the form of shared assumptions and goals among ISD stakeholders, exists.
Lineraity	ISD is a process that can be represented as a set of linear, sequential steps.
Universality	ISD is a replicable, repeatable, and standardized process.
Rationality	ISD is a rational choice process, in terms of requirements analysis, resource allocation, implementation strategy, and so on.
Goal pre-determination	ISD idealizes stability in goal predetermination and process predetermination (in order to achieve the predetermined goal).

1- Chatterjee et al., 2009

Functionalist ISD approaches compromise fairness

"The concept of fairness implicitly assumes that one needs to have a complete picture of the surrounding reality" [1].

- Gaining a deep understanding of the problem and context is necessary in ISD.

If ISD includes an ethical analysis, to improve fairness, we can gain a better image of the problem domain and context [1].

Assumption	How it compromises fairness [1]
Control	Control curbs creativity and suppresses dissenting voices
Social Integration	Achieving consensus between numerous ISD actors is impossible
Lineraity	ISD often requires ad-hoc actions, thus do not spend enough time on stakeholder analysis
Universality	An assumption of universality ignores cultural and contextual differences
Rationality	ISD requires ad-hoc actions Any assumption of rationality sets up unfair expectations among stakeholders
Goal pre-determination	An assumption of goal/process pre-determination fails to consider the causes of potential disagreements and instability in stakeholders lives.

1- Chatterjee et al., 2009

Postmodern Ethics and ISD

"Before society, its law-makers, and its philosophers come down to spelling out its ethical principles, there are beings who have been moral without the constraint of codified goodness" [1, p. 61].

- Ethicality in any social process (e.g. ISD) starts form enacting moral responsibility toward "the other" stakeholders of the process (e.g. consumers, customers, employees, investors, vendors, etc.)

IT causes distanciation between individuals developing the technology, individuals using the technology, and individuals affected by the technology [2].

- The moral responsibility associated with digital artefacts tends to get diffused leading to different issues (e.g. invisibility of consequences, de-individuation).

1- Bauman, 1993
2- Chatterjee et al., 2009

Example: Technical Debt

It is common for software development teams to take shortcuts, ignore best practices, or omit certain development activities under resource constraint or market demands [1].

- Reduce time to market or preserve resources
- Increase velocity
- Create business opportunities or digital options

Technical Debt (TD) highlights the latent costs and obligations of such short-term compromises and sub-optimal decisions [1,2].

- *Let it go and we will fix it later!*

1- Ghanbari et al., 2018
2- Elbanna & Sarker, 2016
3- Omeyer, 2020

Consequences of TD for different stakeholders

TD, especially when left unmanaged, has severe consequences for organisations, their stakeholders, and society [1-3].

- Lower quality & unexpected delays
- Lower digital innovation capacity
- Reduced developer morale and performance
- Lower customer satisfaction
- Financial costs

The global costs of TD was estimated to be over 300 billion USD [4].

Finland's GDP in 2022 was 280 Billion USD.

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1- Ghanbari et al., 2018
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The New York Times

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By DAVID GELLES UPDATED October 28, 2019

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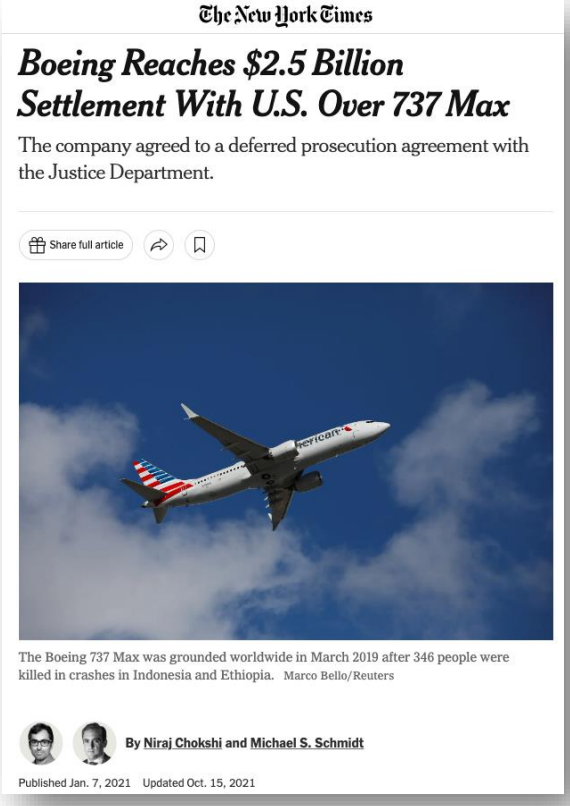

The New York Times

Boeing Reaches $2.5 Billion Settlement With U.S. Over 737 Max

The company agreed to a deferred prosecution agreement with the Justice Department.

Share full article

The Boeing 737 Max was grounded worldwide in March 2019 after 346 people were killed in crashes in Indonesia and Ethiopia. Marco Bello/Reuters

By Niraj Chokshi and Michael S. Schmidt

Published Jan. 7, 2021 Updated Oct. 15, 2021

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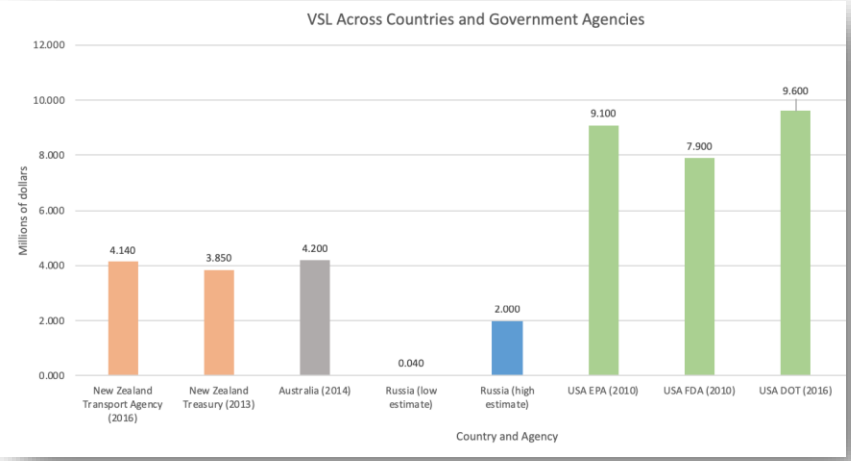
1- Ghanbari et al., 2018
2- Elbanna & Sarker, 2016
3- Ghanbari et al., 2017

How to measure the costs of the crash for stakeholders?

The value of a statistical life (VSL) is an economic value or the marginal cost of preventing death.

- It is beneficial in risk management, as a deterrent for companies to prevent injuries and death.
- The value of lost lives= 346 x $9.6 mil = $3.3 billion



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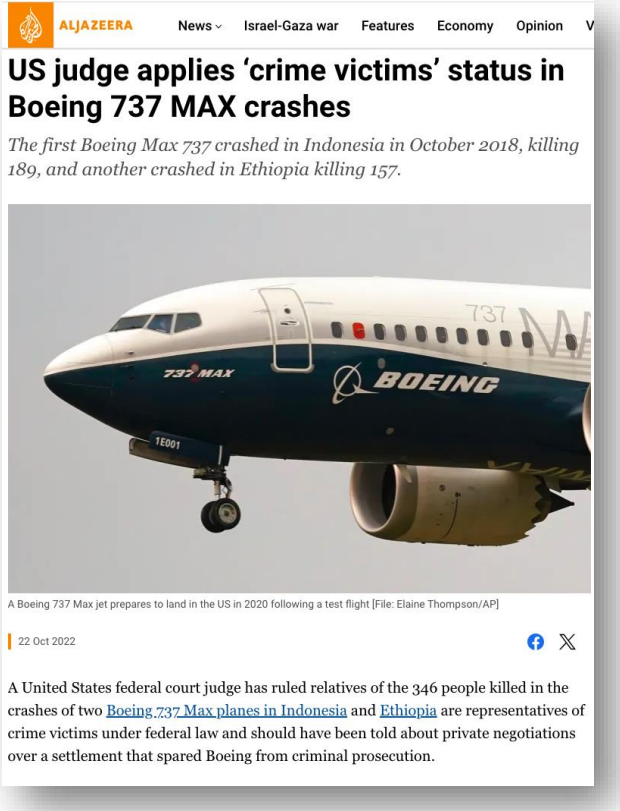
Is it possible to measure, compare, monetize mortality risk and environmental goods and put them on a single scale?



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US judge applies 'crime victims' status in Boeing 737 MAX crashes

The first Boeing Max 737 crashed in Indonesia in October 2018, killing 189, and another crashed in Ethiopia killing 157.

A Boeing 737 Max jet prepares to land in the US in 2020 following a test flight [File: Elaine Thompson/AP]

22 Oct 2022

A United States federal court judge has ruled relatives of the 346 people killed in the crashes of two Boeing 737 Max planes in Indonesia and Ethiopia are representatives of crime victims under federal law and should have been told about private negotiations over a settlement that spared Boeing from criminal prosecution.

Who is responsible for the design decisions underlying a service?

Who should be held accountable for the design decisions made during digital innovation processes?

- Software professionals or organisations?

Who is responsible for the consequences of the design decisions underlying digital solutions?

- Service providers or customers?

Individuals vs. Organisations Responsibilities

Any design decision made while developing digital artefacts has a set of ethical, legal, societal and environmental responsibilities [1,2].

- While some decisions are made at the organisational level and must be considered from a business ethics perspective, software professionals are the ones who decide how to implement these decisions [2].

Software professionals should take more responsibility for the consequences of their decisions and their broader impacts on society and environment [3].

1- Becker et al., 2015
2- Gogoll et al.,
3- Venteres et al.,

Addressing Ethics in ISD

Ethical ISD

Development teams must identify "the Other", the stakeholders of an ISD process in terms of contract, legal rights, or the harms and benefits of design decisions.

- Inclusion of stakeholders adds to the fairness of ISD

Development teams must find strategies to implement their moral responsibility for the stakeholders.

- Become familiar with the stakeholders and their contexts
- Consider consequences of ISD
- Avoid de-individuation
- Increase artefact ownership

1- Chatterjee et al., 2009

Value Sensitive Design

VSD is an iterative approach that integrates conceptual, empirical, and technical investigations to accounts for human values throughout the design process.

- Conceptual investigations
- Empirical investigations
- Technical investigations

The word "value" refers to what a person or group of people consider important in life

- Privacy, ownership and property, physical welfare, freedom from bias, universal usability, autonomy, informed consent, and trust

1- Friedman et al., 2013

Conceptual Investigations

Conceptual investigation consists of a "philosophically informed" analysis of certain values (e.g. privacy, informed consent) integrated into a system and to identify potential issues raised from using the system [1, 2].

- Who are the direct and indirect stakeholders of a system?
- How are both classes of stakeholders affected?
- What values are implicated?
- How should we engage in trade-offs among competing values in the design, implementation, and use of the system (e.g., autonomy vs. security, or anonymity vs. trust)?
- Should moral values (e.g., a right to privacy) have greater weight than non-moral values (e.g., usability, aesthetic preferences)?

1- Friedman et al., 2013
2- Yetim, 2011

Empirical Investigations

Empirical investigation aims at understanding the human response to a system as well as the larger social context in which the system is implemented and used.

- How do stakeholders apprehend individual values in the interactive context?
- How do they prioritize competing values in design trade-offs?
- How do they prioritize individual values and usability considerations?
- Are there differences between espoused practice (what people say) compared with actual practice (what people do)?
- What are organisations' motivations, methods of training and dissemination, reward structures, and economic incentives?

1- Friedman et al., 2013
2- Yetim, 2011

Technical Investigations

Depending on their properties, certain technologies and systems are more suitable for serving certain purposes and supporting certain values.

- Technical investigation focuses on designing a system and analysing the "value suitability" of the existing technologies.
  1. Analyse how existing technologies and their properties support or hinder human values
  2. Proactively design the system that supports values identified in the conceptual investigation

Technical investigations may also involve empirical activities that focus on the system itself and not on people.

1- Friedman et al., 2013
2- Yetim, 2011

Privacy by Design

In digital societies, the value of information and the need to manage it responsibly have grown dramatically.

Information privacy has become challenging due to rapid innovation, global competition, and increasing system complexity.

Privacy must be approached from a design-thinking perspective in a holistic, interdisciplinary, and integrative way [1].

Privacy must become integral to organisational priorities, project objectives, design processes, and planning operations.

1- Cavoukian, 2009

Privacy by Design

The 7 Foundational Principles of Privacy by Design [1]:

1. Proactive not Reactive; Preventative not Remedial
2. Privacy as the Default Setting
3. Privacy Embedded into Design
4. Full Functionality – Positive-Sum, not Zero-Sum
5. End-to-End Security – Full Lifecycle Protection
6. Visibility and Transparency – Keep it Open
7. Respect for User Privacy – Keep it User-Centric

1- Cavoukian, 2009

Privacy by Design: The Game

Authors: Katie Shilton, Adam Porter, Susan Winter, Donal Heidenblad

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How to play

You are developing a new mobile app and you need to create a privacy policy for the app to decide what data to collect from users and who can access the data.

1. **Choose your role in the team**
2. **Check the game rules together**
3. **Play the game (you have 25 tokens)**
4. **Have a discussion about the game**

Roles

Developer
The developer cares about the product working well. The developer prioritizes the resource of "developer time," because their time is a precious resource for making the product work well. Try not to let developer time fall below 10.

UX Designer
The UX Designer cares about the user experience using the app. The UX Designer prioritizes the game resource of "user trust", because this is how user satisfaction is measured. Try not to let user trust fall below 10.

Manager
The manager strives for a balanced product. They must monitor both the resource of "developer time," because this is how they will build a bigger team, and also the resource of "user trust," because this is how they will ensure that their product has a customer base. Try not to let either developer time or user trust fall below 10.

Results

Beloved but outdated (1-10 dev resources, 25+ user trust)

You have a product users really trust, but it was *expensive* to develop. You win, but product updates for this product, or your next product, may be delayed or postponed indefinitely.

Bleeding edge, bleeding users (25+ dev resources, 1-10 user trust)

You have a top of the line product that you developed efficiently, but users are never sure whether they can trust you. You win, but your brand is troubled, and you may have trouble attracting users to your next product.

Middle of the road (10-25 dev resources, 10-25 user trust)

Your balanced strategy played it safe. You're neither an industry superstar nor a fan favorite, but you have a solid development and user retention strategy.

Reflection and discussion

What do you think about the game?

Was it realistic enough?

Did it help you to think about privacy and trade-offs around it?

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