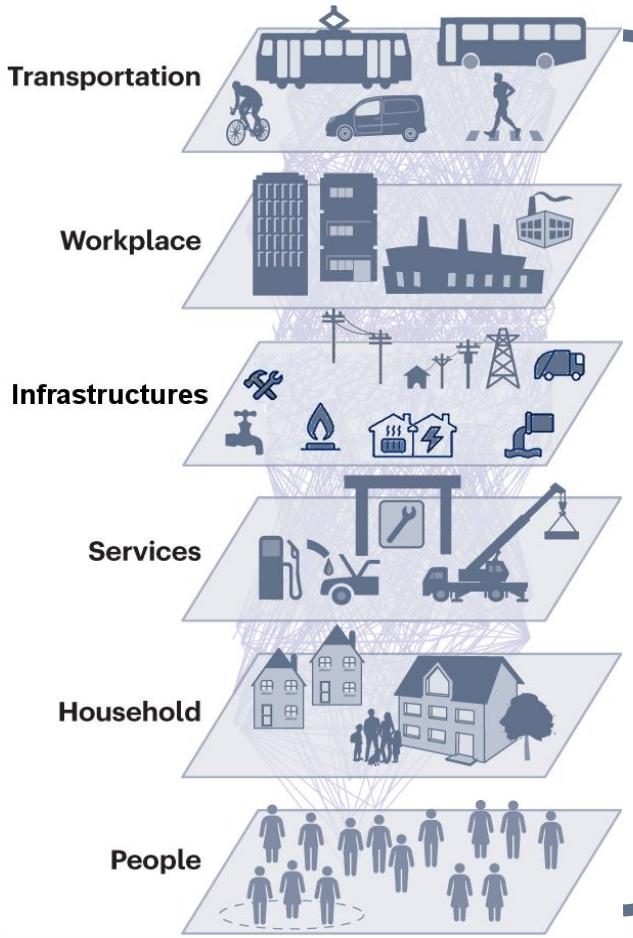
Rodolfo BAGGIO[1]

1 – Bocconi University

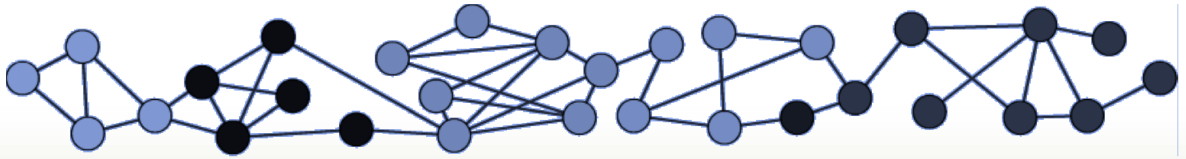
Technologies for smart cities

City

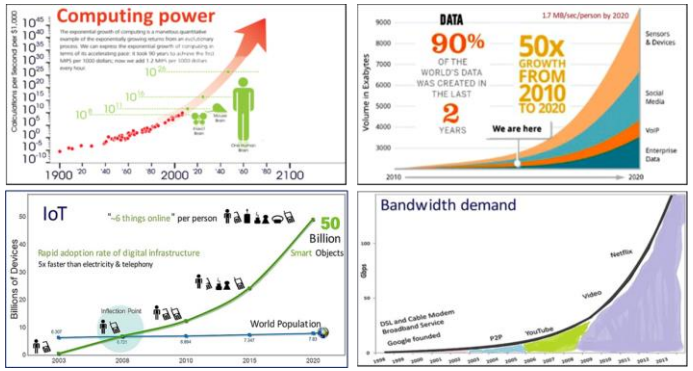
A city is not just a collection of buildings, infrastructure, and people, but an interconnected, dynamic assembly of many components that interact in a non-linear dynamic way

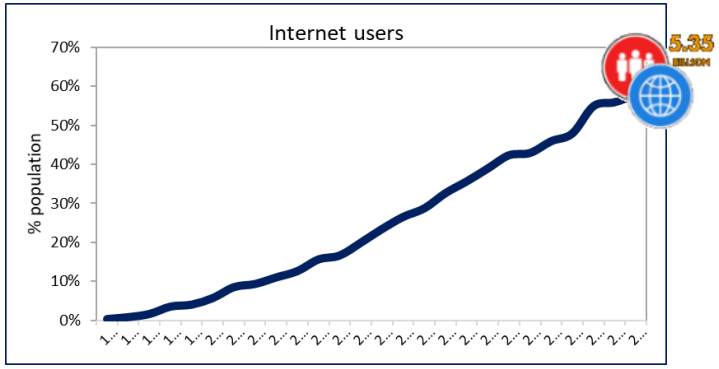


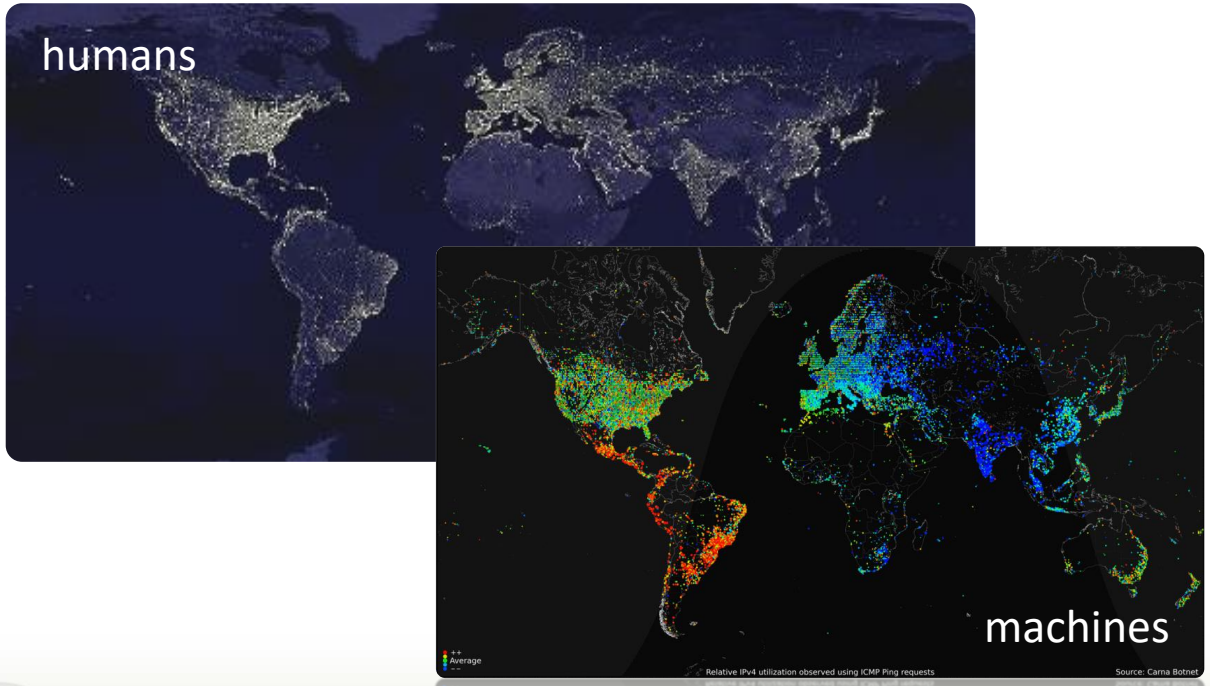
a complex adaptive system



Technologies



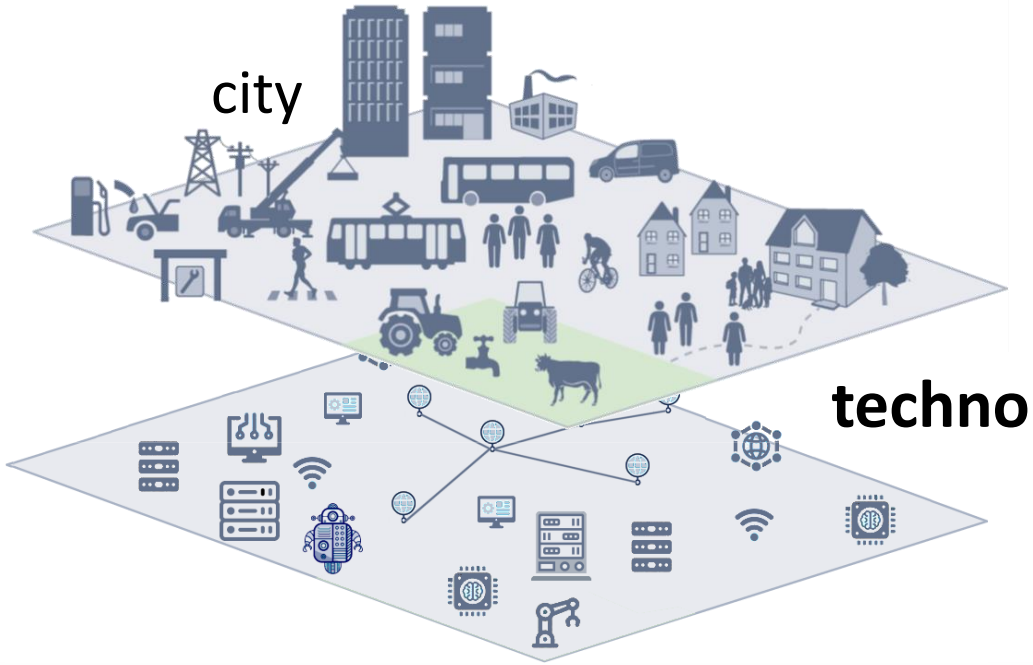




The Internet and the Web are not merely technological phenomena; they represent social structures and processes.

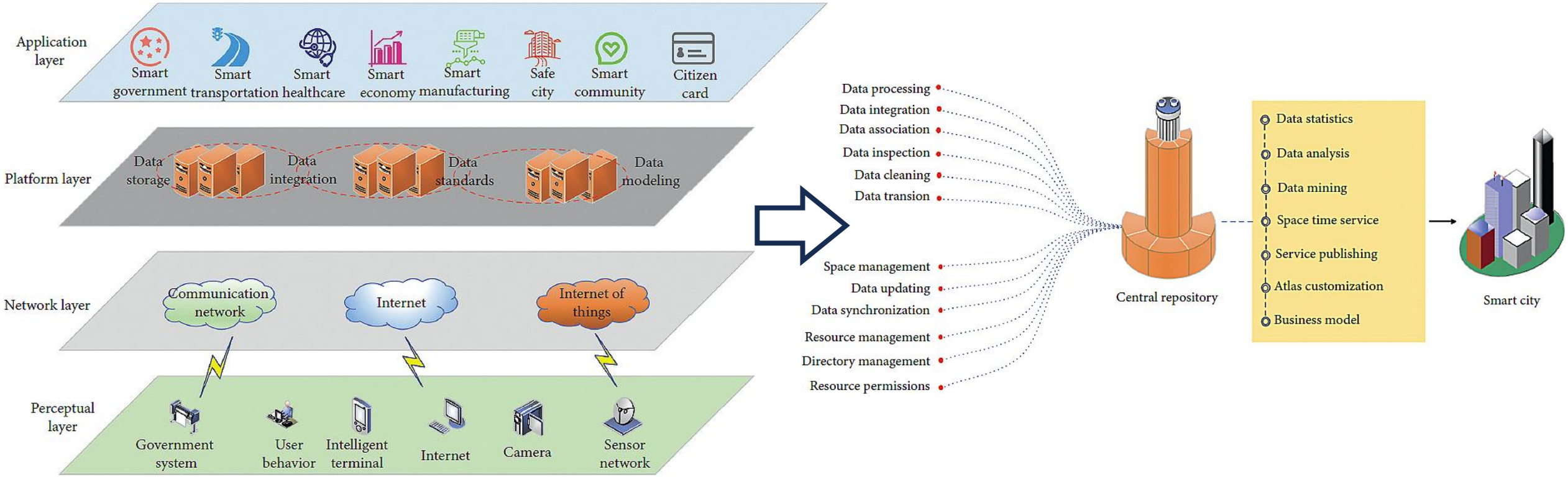
Smart city

A smart city integrates digital technologies into its networks, services and infrastructure to improve operational efficiency and deliver better quality of government, services and citizen welfare.

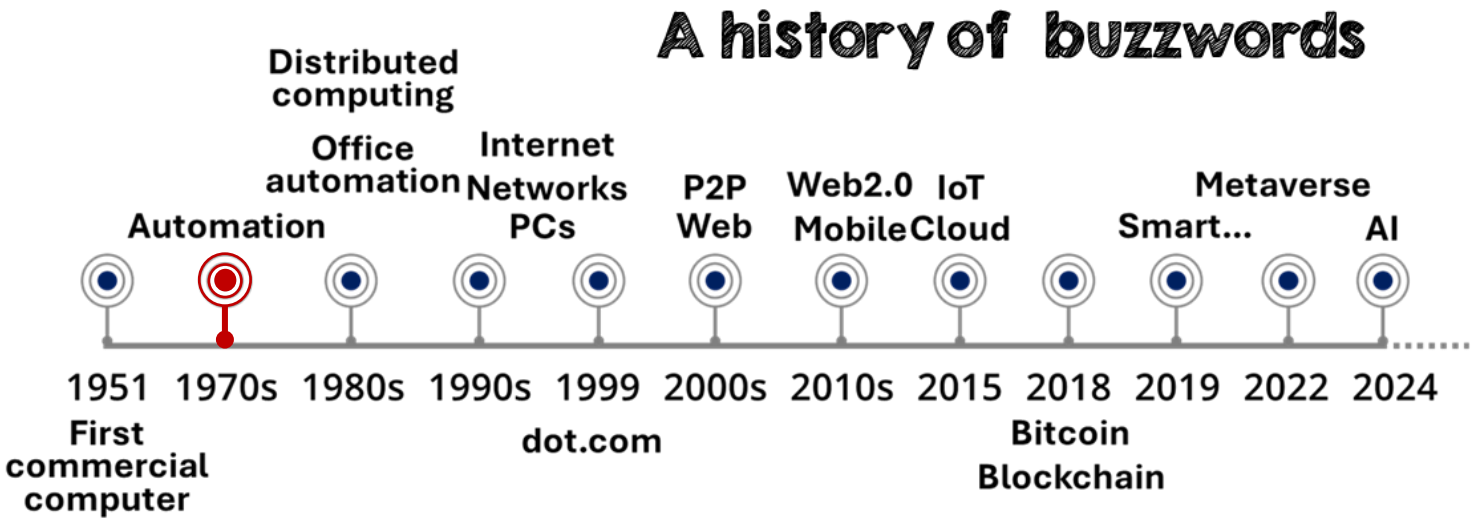


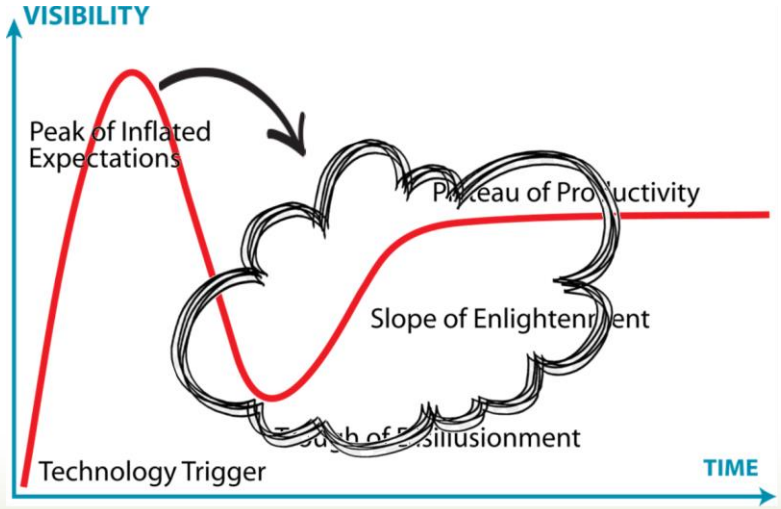
technology

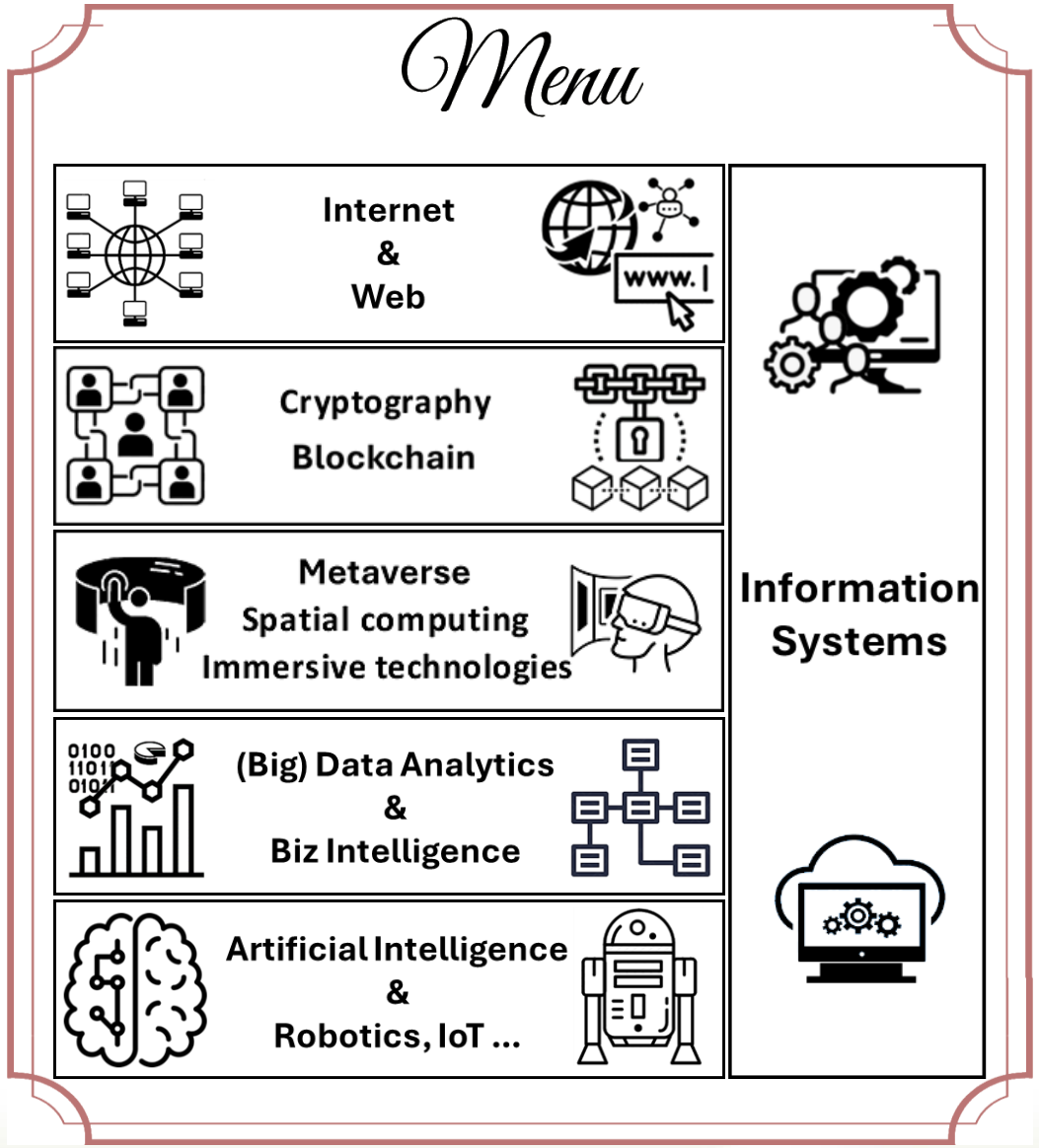
Smart city: the architecture



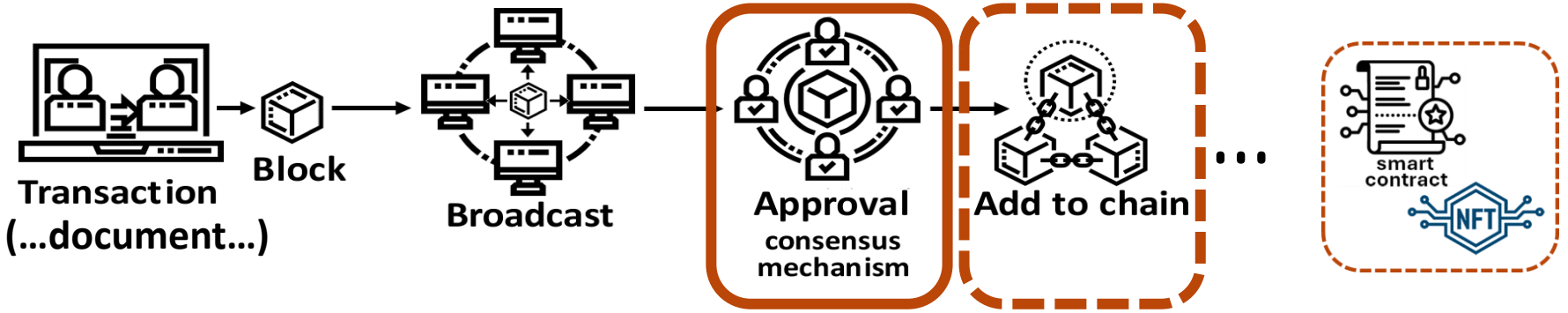
Digital technologies





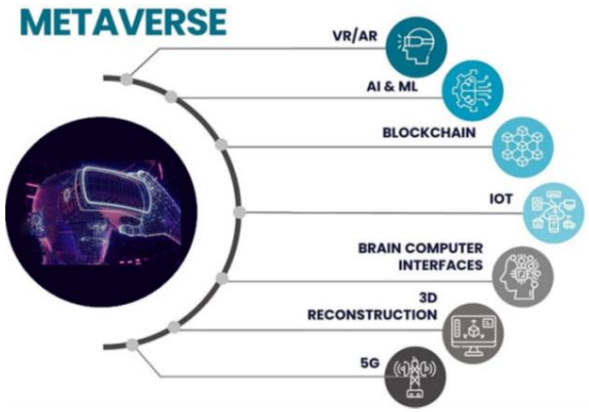


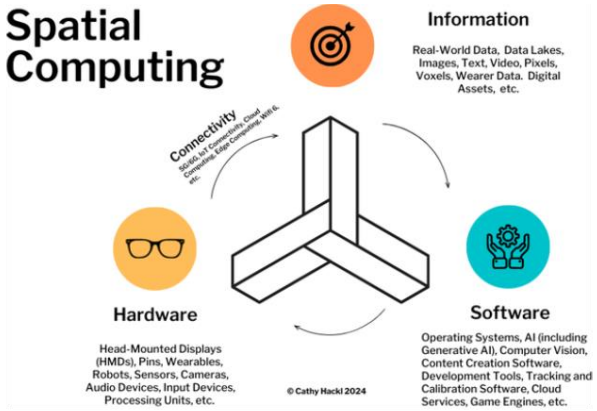
Cryptography
Blockchain

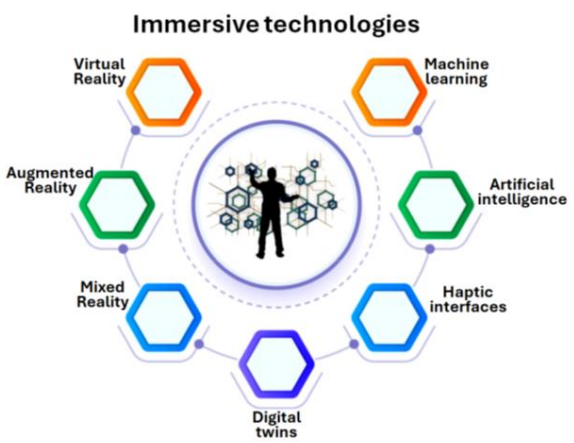


Metaverse
Spatial computing
Immersive technologies

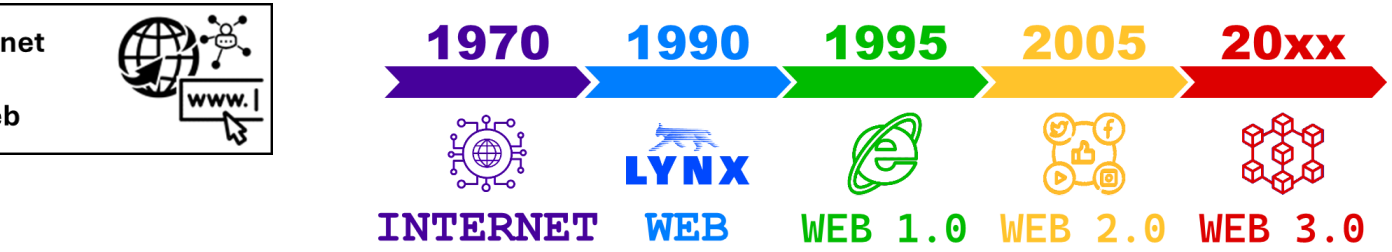
a
Lego-like
game

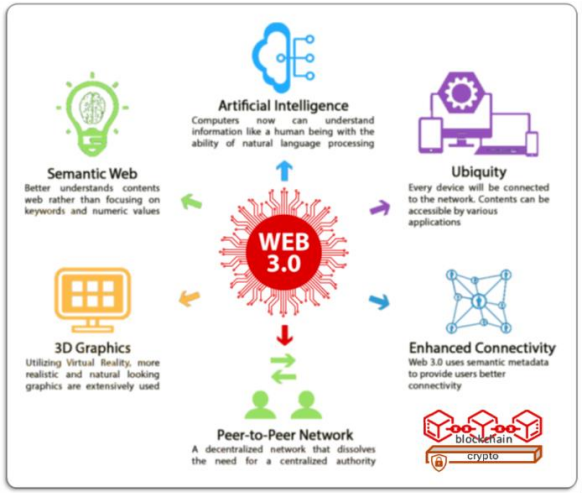






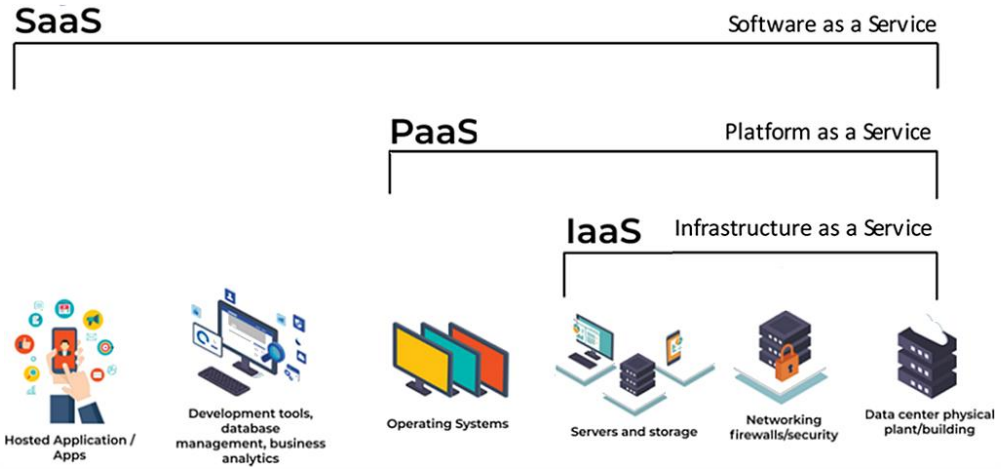
Internet
&
Web

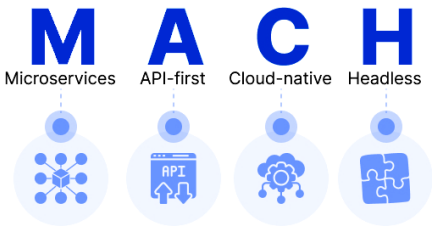


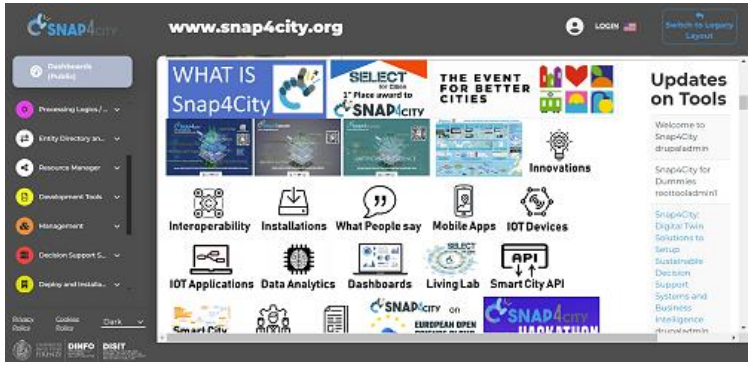


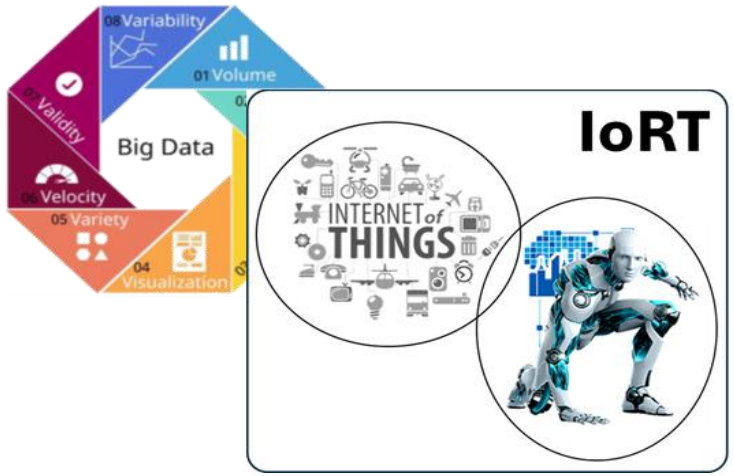
Information
Systems

Cloud
Computing
Flexibility



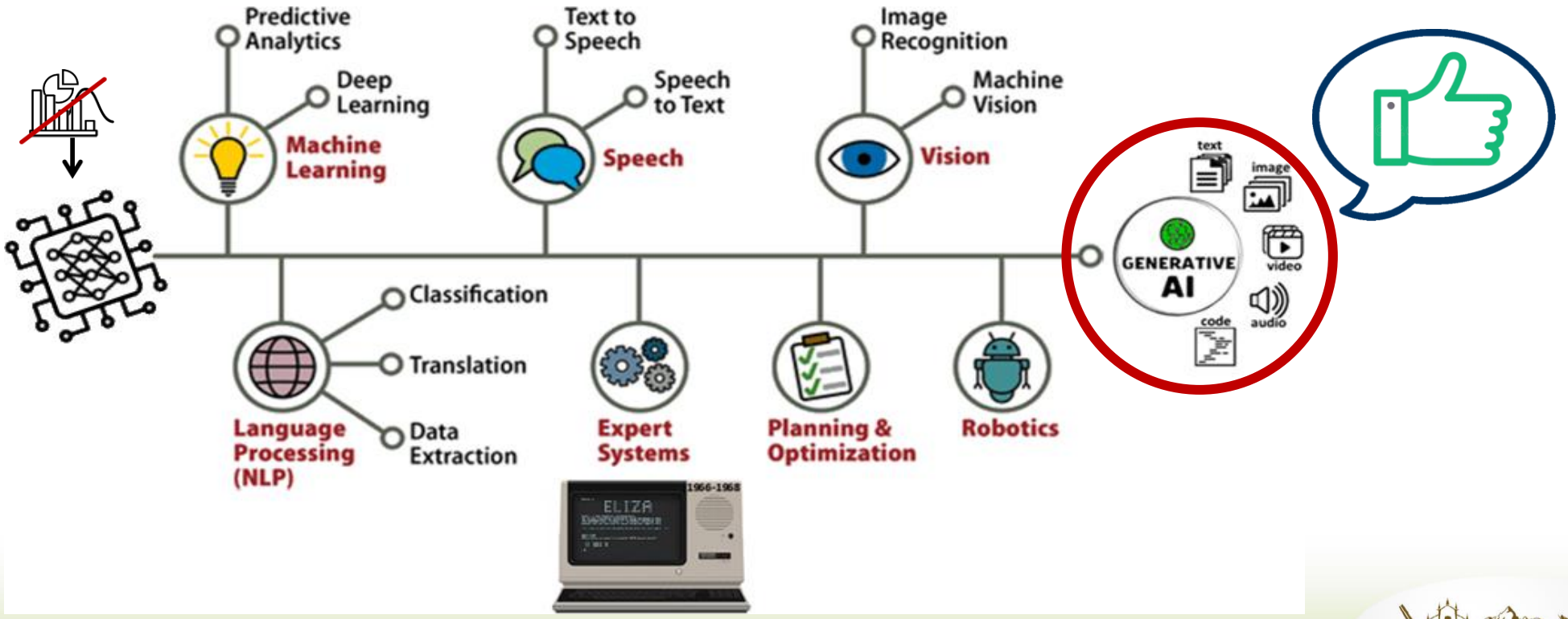






(Big) Data Analytics
&
Biz Intelligence

Artificial Intelligence
&
Robotics, IoT ...



The ethical side [aka: there's no such thing as a neutral technology]

Augusta Ada King, countess of Lovelace, 1815–1852

It is desirable to guard against the possibility of exaggerated ideas that might arise as to the powers of the Analytical Engine. [...] The Analytical Engine has no pretensions whatever to originate anything. It can do whatever we know how to order it to perform. ***It can follow analysis; but it has no power of anticipating any analytical relations or truths****. Its province is to assist us in making available what we are already acquainted with.*

[AAL, 1843]

Andreas Ekström
AWARD WINNING JOURNALIST, AUTHOR AND DIGITAL FUTURIST

Behind every algorithm there's a person with a set of personal beliefs that no code can ever eradicate

On Good and Evil, and the Mistaken Idea that Technology is Ever Neutral

The design of any technology is a moral act. The neutrality thesis tries to hide this fact, and the responsibilities that it implies. This is unhelpful also because it makes it difficult to clarify the ethical choices and trade-offs that many technologies often require and, therefore, the policies and regulations that need to be devised.

Awareness

Knowledge

Evaluation

Applicability

Policies/rules

AI: ethical issues

Ethical Questions in AI

Bias:
Is AI fair?

Liability:
Who is responsible for AI?

Security:
How do we protect access to AI from bad actors?

Human Interaction:
Will we stop talking to one another?

Employment:
Is AI getting rid of jobs?

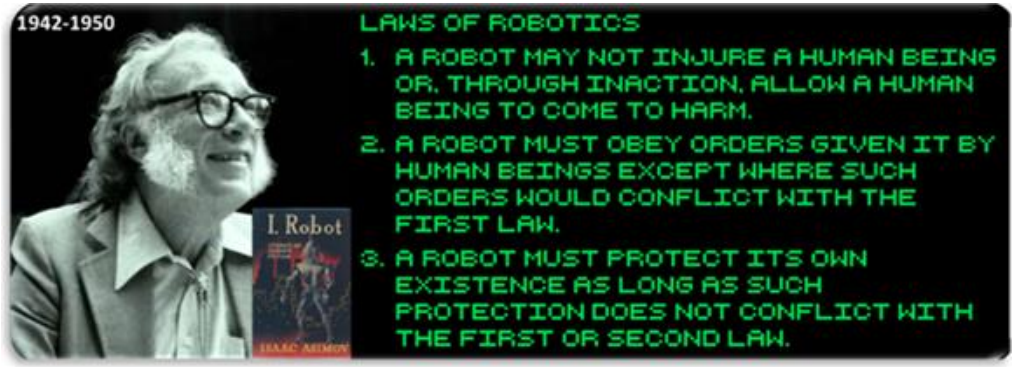
Wealth Inequality:
Who benefits from AI?

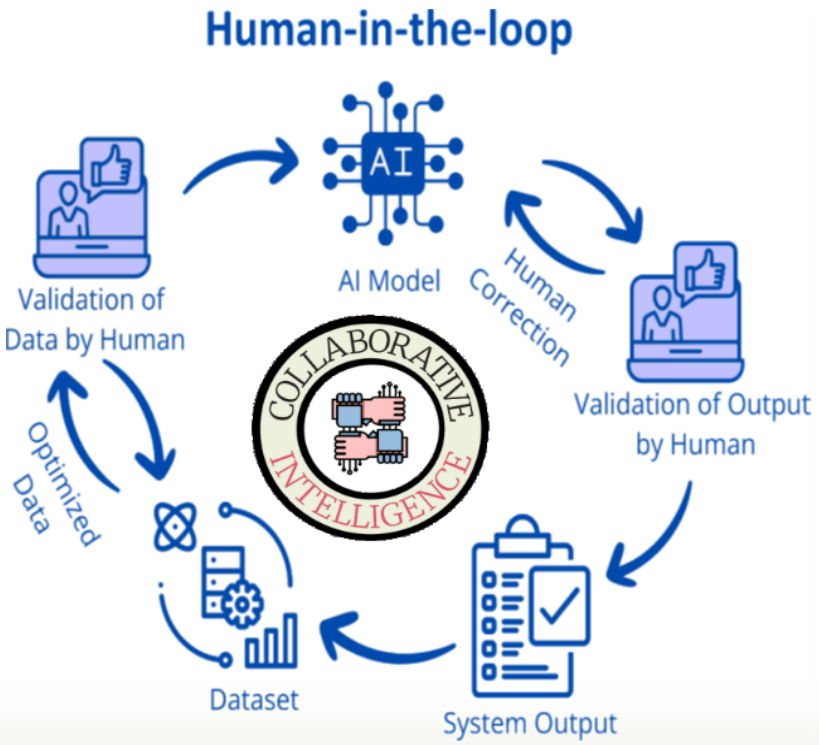
Power & Control:
Who decides how to deploy AI?

Robot Rights:
Can AI suffer?

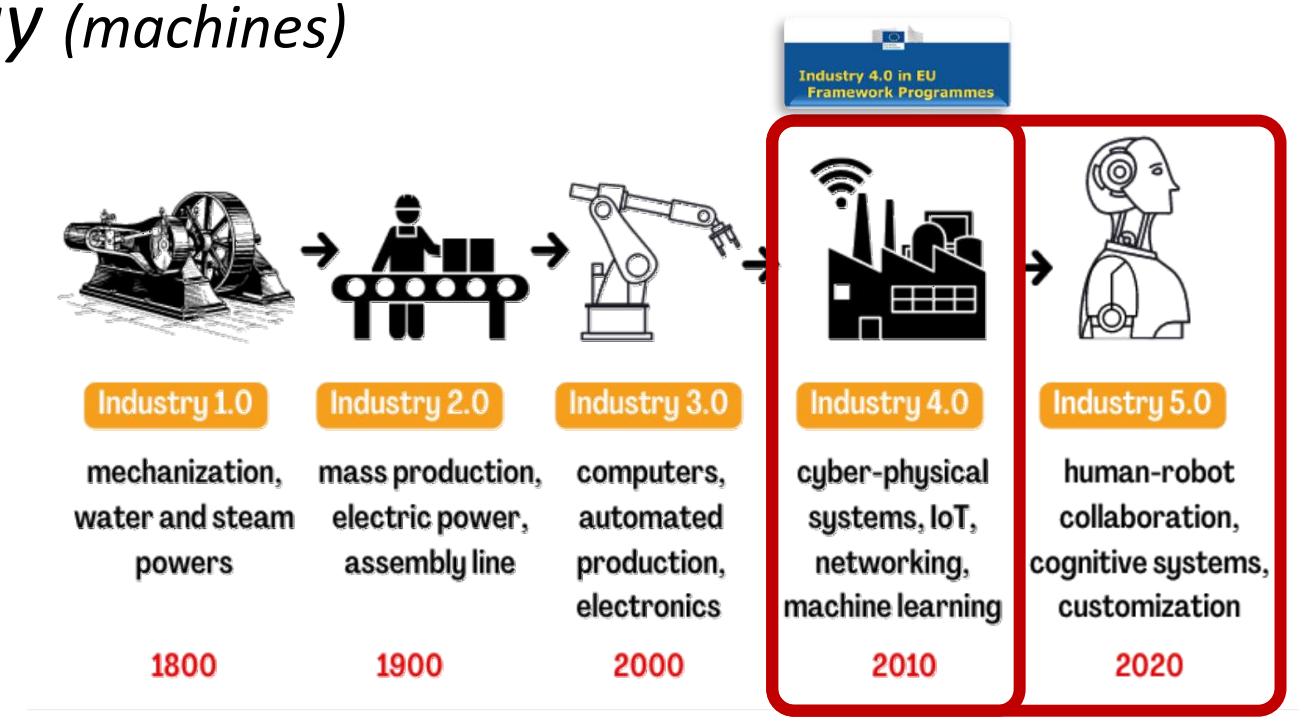
Artificial stupidity:
How to recover from AI errors/mistakes?

Regulations





Humans & technology (machines)

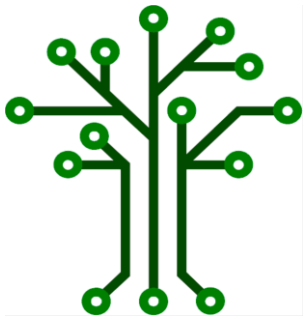


"The Industry 4.0 paradigm, as currently conceived, is not fit for purpose in a context of climate crisis and planetary emergency, nor does it address deep social tensions. On the contrary, it is structurally aligned with the optimization of business models and economic thinking that are the root causes of the threats we now face. The current digital economy is a winner-takes-all model that creates technological monopoly and giant wealth inequality. " [EU ESIR Policy brief, 2022]

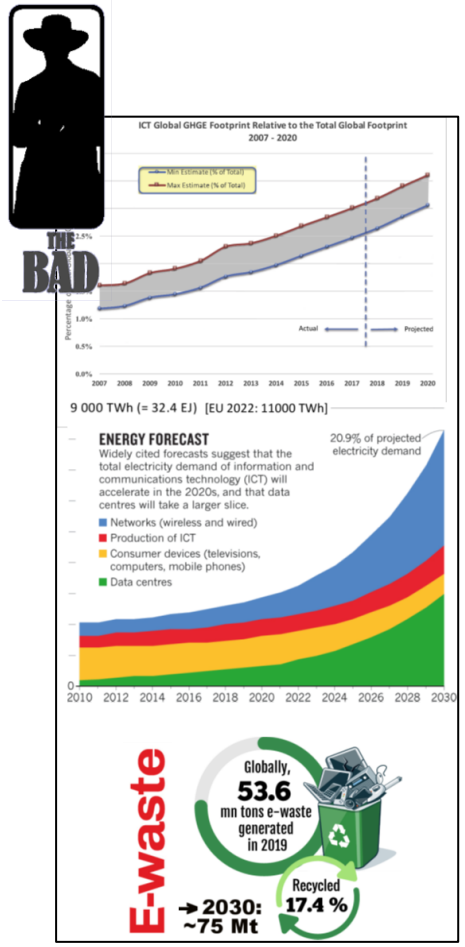
Digital sustainability

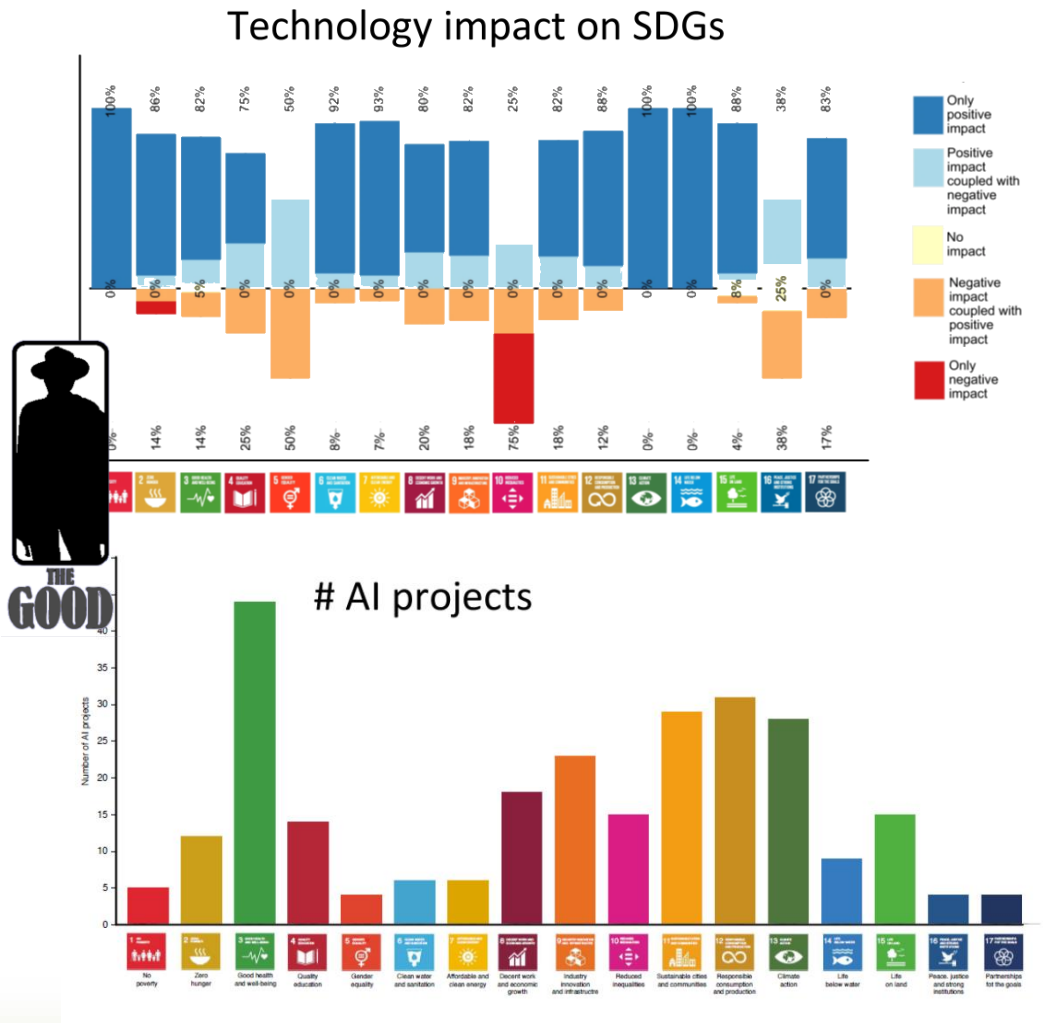
Digital technologies can be both a solution and a problem for the environment, the economy and the society

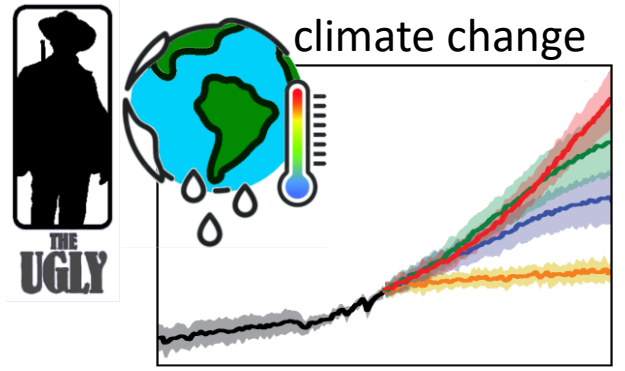
We need a convergence of digital and sustainability imperatives, involving a transdisciplinary approach to using digital technologies to address sustainability issues, while making them environmentally, economically and socially sustainable.

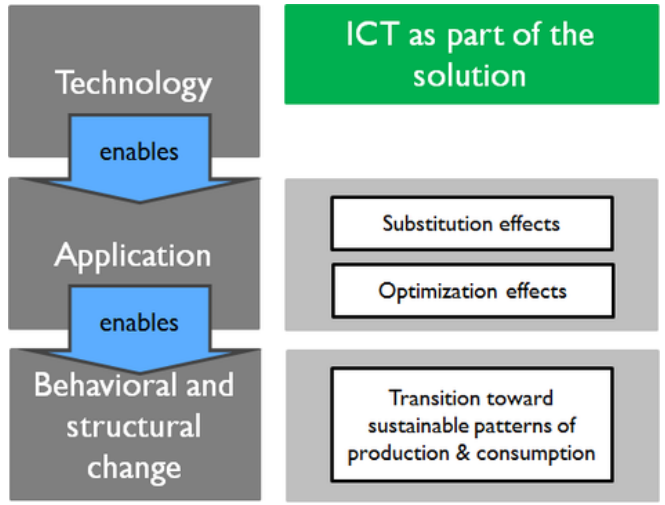


Sustainability & digital technologies









but…

If you digitize a shitty process you'll end up with a shitty digital process

Thorsten Dirks
ex CEO of Telefónica DE

Harvard Business Review
July-August 90 Number 4

Reengineering Work: Don't Automate, Obliterate

by Michael Hammer

"Instead of embedding outdated processes in silicon and software, we should obliterate them and start over."

Putting all together: some final considerations (1)

- **Limitless Potential**
  - the *only* limit today in using modern technologies is the level of imagination and creativity, especially when transforming cities into smart cities
- **Holistic Transformation**
  - achieving a smart city goes well beyond digital technology; it requires the reengineering of physical and organizational structures to align with new capabilities
- **Adaptive Infrastructure**
  - successful smart city infrastructures should be interoperable, open, and capable of scaling in both intensity and functionality, based on a continuous monitoring of all needs
- **Human-Centered Approach**
  - aligning with Industry 5.0, future smart cities should prioritize sustainable, circular, and regenerative value creation over pure technological and economic growth

Putting all together: some final considerations (2)

- **Stakeholder Education**
  - all stakeholders must be informed and educated on how technology can enhance operations, fostering organizational and cultural shifts towards smarter processes
- **Shared Responsibility**
  - the success of a smart city relies on the joint collective efforts of public and private stakeholders to integrate physical and digital systems for improved livability and competitiveness
- **Collaborative Governance**
  - city governance should prioritize innovation, connectivity, and citizen-centric policies, building a collaborative ecosystem where knowledge is shared openly among all sectors
- **Policy Support**
  - Policymakers should drive smart city initiatives that encourage cross-sector collaboration with a strong commitment to innovation and competitiveness

THE 1ST SMART CITIES, TOWNS, RURAL AND MOUNTAIN VILLAGES INTERNATIONAL CONGRESS

SCIENTIFC PARTNERS

COMMUNICATION PARTNER