



Gamechanger AI

THE AI REVOLUTION

AND OUR RESPONSIBILITY FOR THE FUTURE OF HUMANS, ORGANIZATIONS AND MACHINES

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**The AI Revolution - and our Responsibility for the
Future of Humans, Organizations and Machines**



<https://link.springer.com/book/10.1007/978-3-030-52897-3>

Klaus Henning

Gamechanger AI

How Artificial Intelligence is
Transforming our World

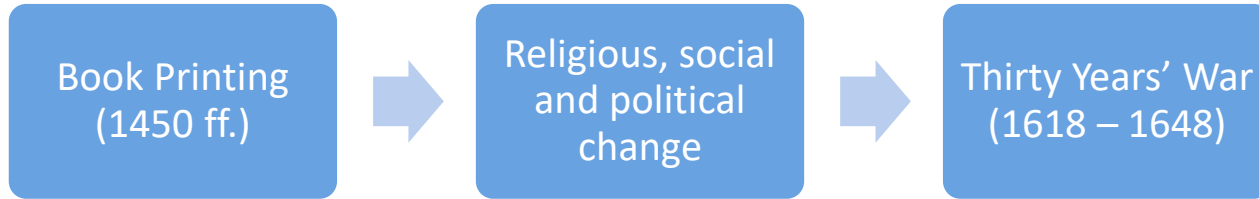
The AI Revolution - and our Responsibility for the Future of Humans, Organizations and Machines

1. The Age of the Digital Universe
2. The Age of Machines with Consciousness
3. The Age of the global-regional Homo Zappiens
4. The Age of hybrid Intelligence

The AI Revolution - and our Responsibility for the Future of Humans, Organizations and Machines

- 1. The Age of the Digital Universe:**
*The digitalization of the world is just starting –
Everyone and everything will be connected*

The biggest “disruptive innovation” of society since Gutenberg (1450) is happening just now



Today's worldwide main transition is not only the worldwide digital networking. There is more!

- **Machines, cars and objects of daily life** will have their own consciousness. This is – as well as the just-in-time worldwide networking – a completely new dimension.
- This digital transformation towards “**digital agents, digital shadows, digital twins, digital avatars**” etc. is a global and local revolution. It will redesign all areas of our life extremely. It is unavoidable.
- The digital universe with intelligent machines and networks – having self-awareness – is a **huge chance to reinvent our way of living, working and learning.**

THE AGE OF THE DIGITAL UNIVERSE

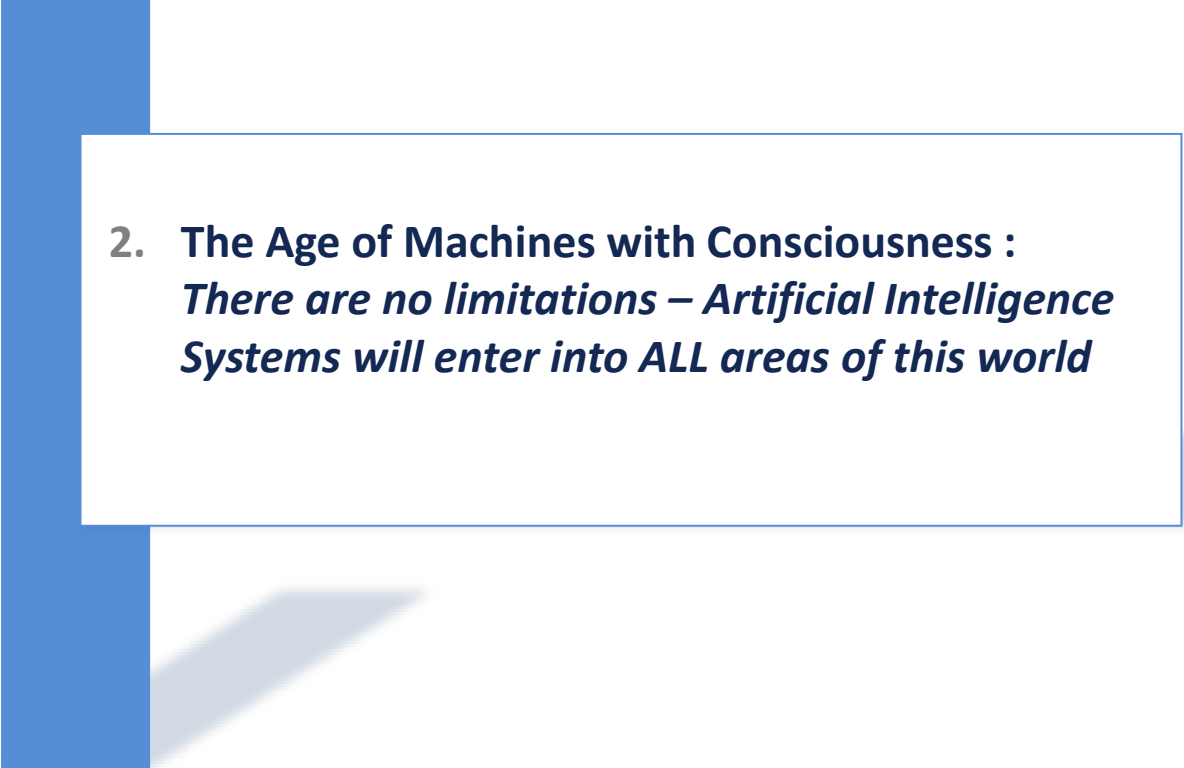
On the long term products with an own intelligence will be normal

Examples:

- The house as **interactive media center** (talking fridges, controlling of the entire energy consumption)
- The **intelligent heating** that adapts its settings according to the behavior and life profile
- The **intelligent plastic window film** that processes solar radiation and contains a computer
- The **thinking car bumper**
- The **implanted cardiovascular pump** against cardiac arrest with intelligent bio materials
- The **computers integrated into clothing** that communicate my position and/or warn me in case of danger
- The **co-operative apartment building** in which all inhabitants are connected with each other



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- 2. The Age of Machines with Consciousness :**
***There are no limitations – Artificial Intelligence
Systems will enter into ALL areas of this world***

CONSCIOUSNESS ?

Consciousness is an integral part of AI systems that develop their own intelligence to a certain extent.

AI ?

Thought Consciousness (A-consciousness): This area of consciousness includes the ability to develop models of the perceived environment and to reflect on them, i.e. including to monitor and control one's own perception.



Phenomenological consciousness (P-consciousness): This model focuses on the subjective experience of pain, temperature, or colors.

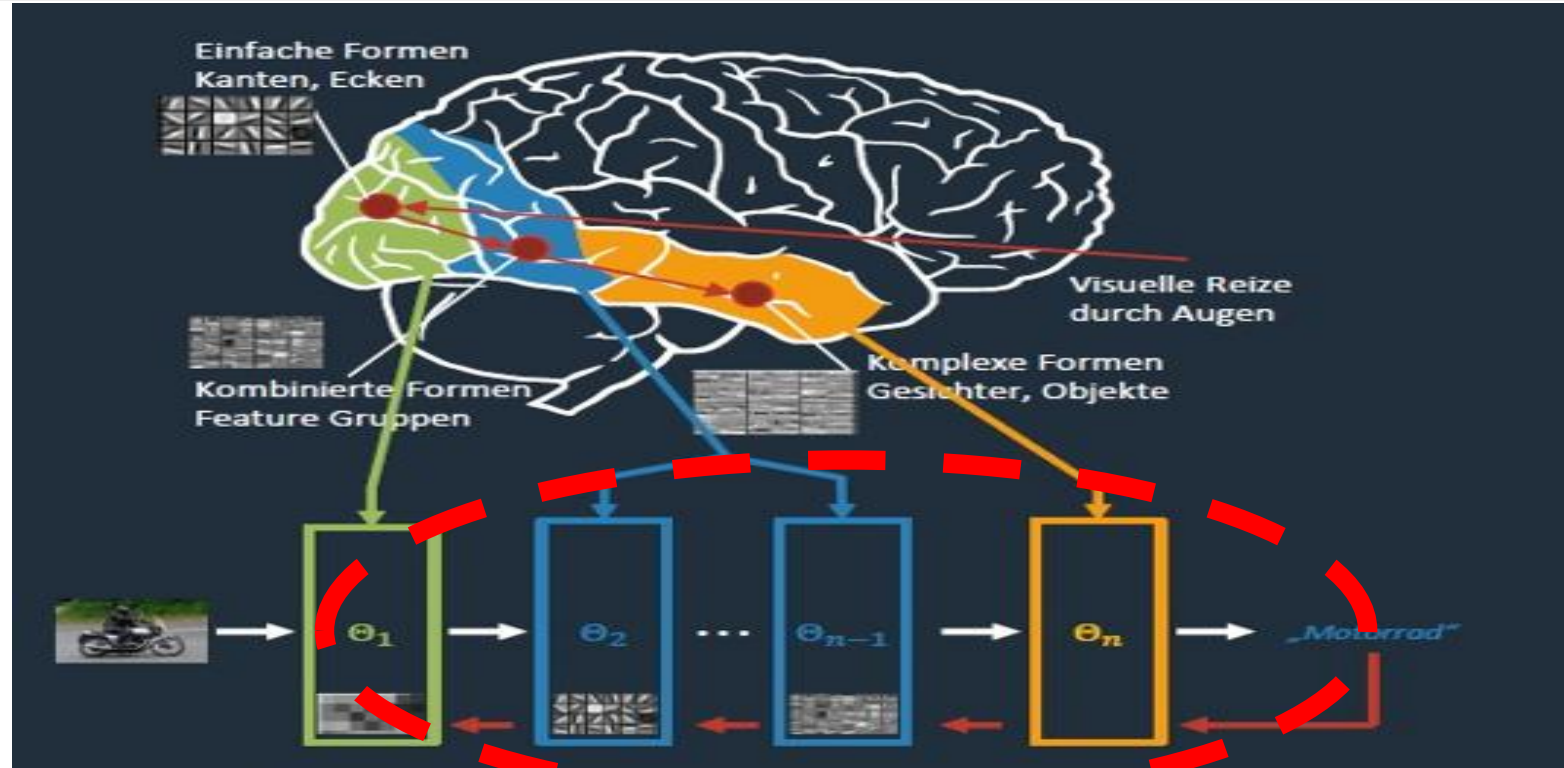


Self-awareness: This is about the ability to differentiate oneself as a person from other people and to recognize and develop one's own identity—the ego-consciousness.



THE AGE OF MACHINES WITH CONSCIOUSNESS

**Deep Learning based on generative AI and connected with Big Data is the breakthrough:
The machine knows what it is and what it wants; it is learning and reflecting its behavior**



Source: Cybernetics Lab RWTH Aachen

MACHINES WITH CONSCIOUSNESS EXAMPLE 1

Controlled by 200 AI agents based on a democratic design with separation of powers (legislative, executive, and judicial)



An industrial knitting machine

THE AGE OF MACHINES WITH CONSCIOUSNESS

Example: Deep Learning: AlphaGo Zero

Go comes from China and is 2500 years old. It has simple rules and enormous complexity.

The problem: There are 2.57×10^{210} possible positions - that's more than the number of atoms in the universe and 10100 times higher than the complexity of chess

A background image for the AlphaGo Zero announcement. It features a Go board with several stones (black and white) placed on it. Overlaid on the board is the text 'AlphaGo Zero' in a large, white, sans-serif font, with 'Starting from scratch' in a smaller font below it. A dark blue diagonal banner with white text is also present.

AlphaGo Zero
Starting from scratch

On 19.10.2017 AlphaGo Zero was introduced. It knows **ONLY** the rules.
The human factor is practically zero.

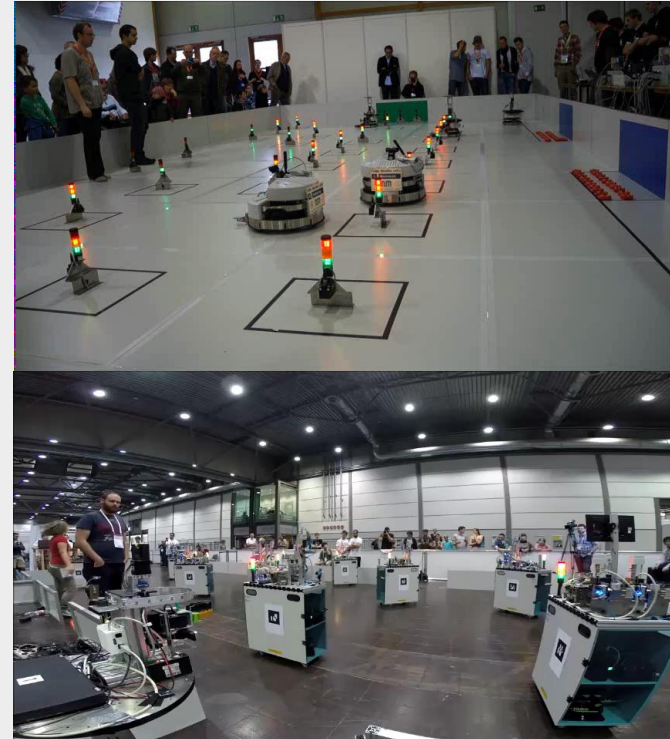
Quelle: Cybernetics Lab, RWTH Aachen

Deep Learning (feedbacked neural networks) combined with Big Data brings it:
The machine knows who it is, what it wants, learns and reflects its behavior.

Success factor:

The product acts autonomously as a "super agent":

- **Totally decentralized**
- **Strict cooperation rules**
- **No "hard coded" components**
- **Intensive sharing of all information**
- **Cooperative decision making**
- **Re-planning during work (thinking break)**



THE AGE OF MACHINES WITH CONSCIOUSNESS

2019: A pneumatic bulk material conveyor runs with strong Artificial Intelligence

Learning 1:

It contains an **algorithm** developed by the Institute for Enterprise Cybernetics that is **20 times more efficient than the Google Mind algorithm**

Learning 2:

For each industrial application, the **"rules of the game"** and the **"cost functions" have to be found anew** - a huge opportunity for industrial innovation.



Source: Institut für Unternehmenskybernetik at RWTH Aachen University

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3. **The Age of the global-regional Homo Zappiens:**
The Generation R creates a completely new understanding of relations towards objects and humans

THE AGE OF THE GLOBAL-REGIONAL HOMO ZAPPIENS

The global-regional Homo Zappiens creates a completely new understanding of the relation to humans and objects

It will become normal to be in **(virtual) working and living environments** spread all over the world:

Work is what you do, not where you go...

Linguistic AI systems (i.e. ChatGPT) are the normal working partners

There will be a **completely new understanding of worldwide relationships** – including networking of data and managing daily routines.

This is a big challenge for all areas of education: **Learning processes based on experience and events are the key.**

* Wim Veen, 25.11.2006

THE AGE OF THE GLOBAL-REGIONAL HOMO ZAPPIENS

The Homo Zappiens is learning extremely simultaneously and non linearly

World Population:
8,25 Bill.
Smart Phones:
7,24 Bill.(6 Bill. user)

Homo Zappiens

- twitch speed
- multi tasking
- non linear approaches
- processing discontinued information
- iconic skills first
- connected
- collaborative
- active
- learning by playing
- instant payoff
- fantasy
- technology as friend

Homo Sapiens

- conventional speed
- mono tasking
- linear approaches
- processing single information flows
- reading skills first
- stand alone
- competitive
- passive
- separating learning and playing
- patience
- reality
- technology as foe

Veen, Wim; Vrakking, Ben: *Homo Zappiens. Growing up in a digital age*. London: Network Continuum Education, 2006.

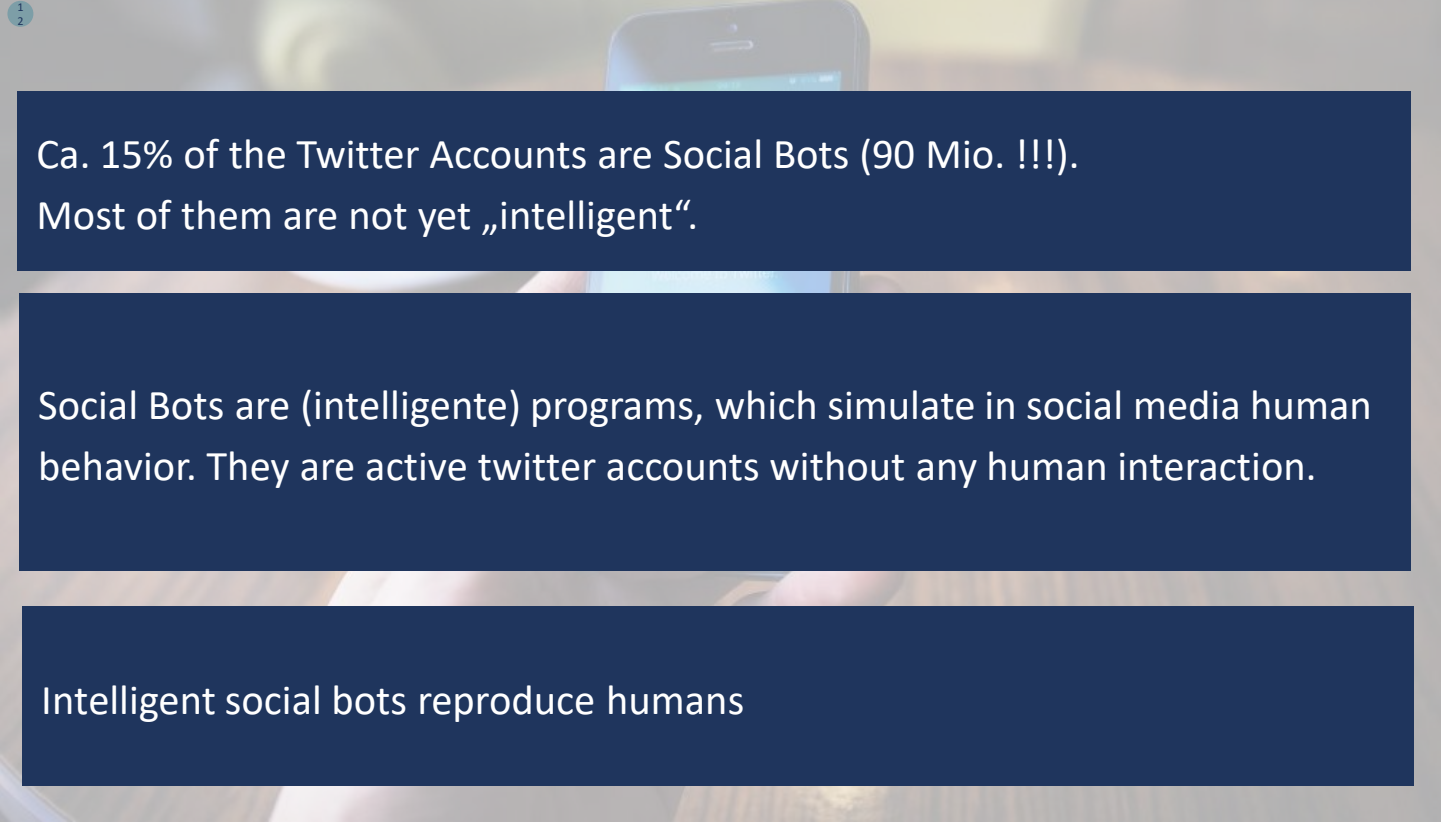
THE AGE OF THE GLOBAL-REGIONAL HOMO ZAPPIENS

SOCIAL MEDIA CHANNELS (2025)

World Population:
8,25 Bill.
Smart Phones:
7,24 Bill. (6 Bill. user)

	Name	Operator	Billion users	Key features
1	Facebook	Meta/USA	3,08	Broad social network: posts, photos, videos, groups, events, marketplace. Very globally positioned; younger target groups less dominant
2	WhatsApp	Meta/USA	>3	Messenger app with text, voice and video function, group chats. Very popular in many countries.
3	YouTube	Google/USA	2,49	Video platform with upload, streaming and community functions. Lots of content: Vlogs, tutorials, music, live streaming.
4	Instagram	Meta/USA	1,74	Focus on photos & videos, stories, reels (short videos). Popular with younger target groups and in social commerce
5	TikTok	ByteDance/China	1,59	Focus on short video format, very high engagement rates, viral trends, strongly geared towards mobile use
6	WeChat	Tencent/China	1,38	"Super app" in China: Messenger, social functions ("Moments"), mobile payment, mini-programs (apps within the app). Strong integration of everyday life & digital.
7	Telegram	Pavel Durov/Dubai	1	Messenger with a focus on privacy, large groups/channels, cross-platform (including desktop). Is also increasingly used as a social network

The inverse Gutenberg revolution – example Twitter



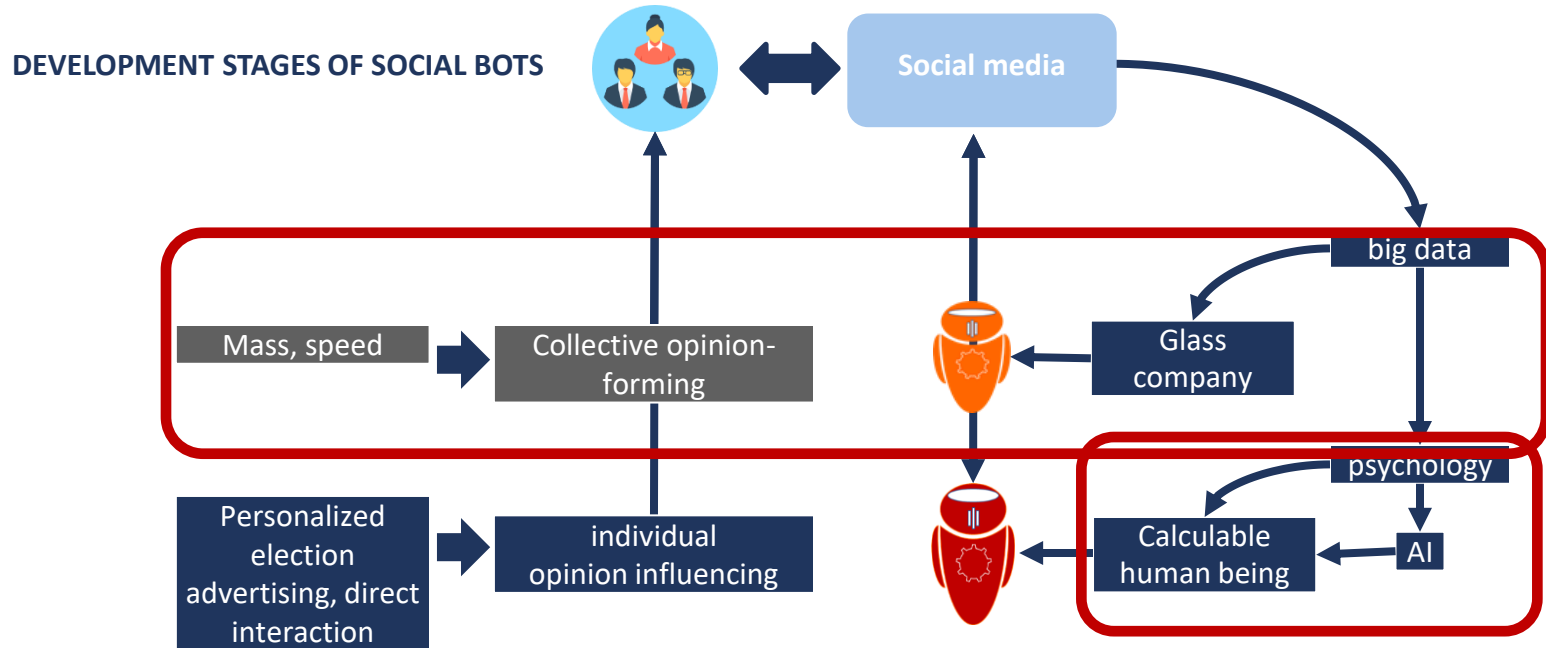
Ca. 15% of the Twitter Accounts are Social Bots (90 Mio. !!!).
Most of them are not yet „intelligent“.

Social Bots are (intelligente) programs, which simulate in social media human behavior. They are active twitter accounts without any human interaction.

Intelligent social bots reproduce humans

THE AGE OF THE GLOBAL-REGIONAL HOMO ZAPPIENS

Political opinion-forming in social media



Source: Dissertation lecture on 11.09.2017 by Bahoz Abbas, Cybernetics Lab, RWTH Aachen University

THE AGE OF THE GLOBAL-REGIONAL HOMO ZAPPIENS

Facebook, Twitter, WhatsApp, Instagram, Titok ... all the time and all simultaneously

Example: The new language



I will not pick you up with the car because I'll have some coffee. Get a bus and get some sweets at the railway station.

Source: Robert Campe (16 j.), What's App Mama?, Eden Books, 2017

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4. **The Age of hybrid Intelligence:**
*The Human-Machine-Interaction will be transformed
in a new cooperation between humans and
intelligent objects*

THE AGE OF HYBRID INTELLIGENCE

The Digital Shadow (Digital Twins) will become a dominant part of the technological and human identity

The levels of interaction

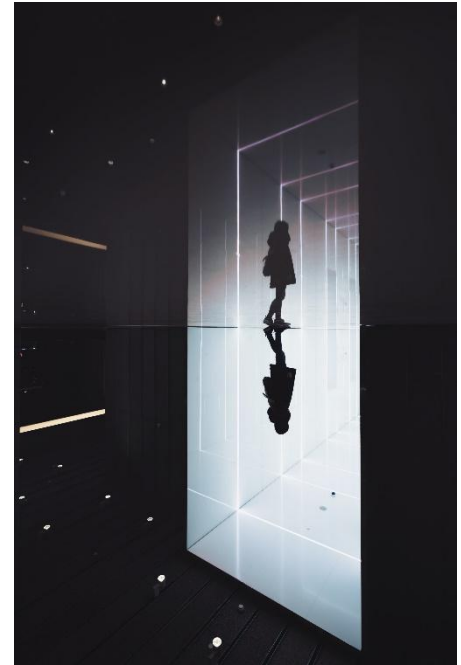


The communication between the shadows of

machines 2 machines,

humans 2 humans,

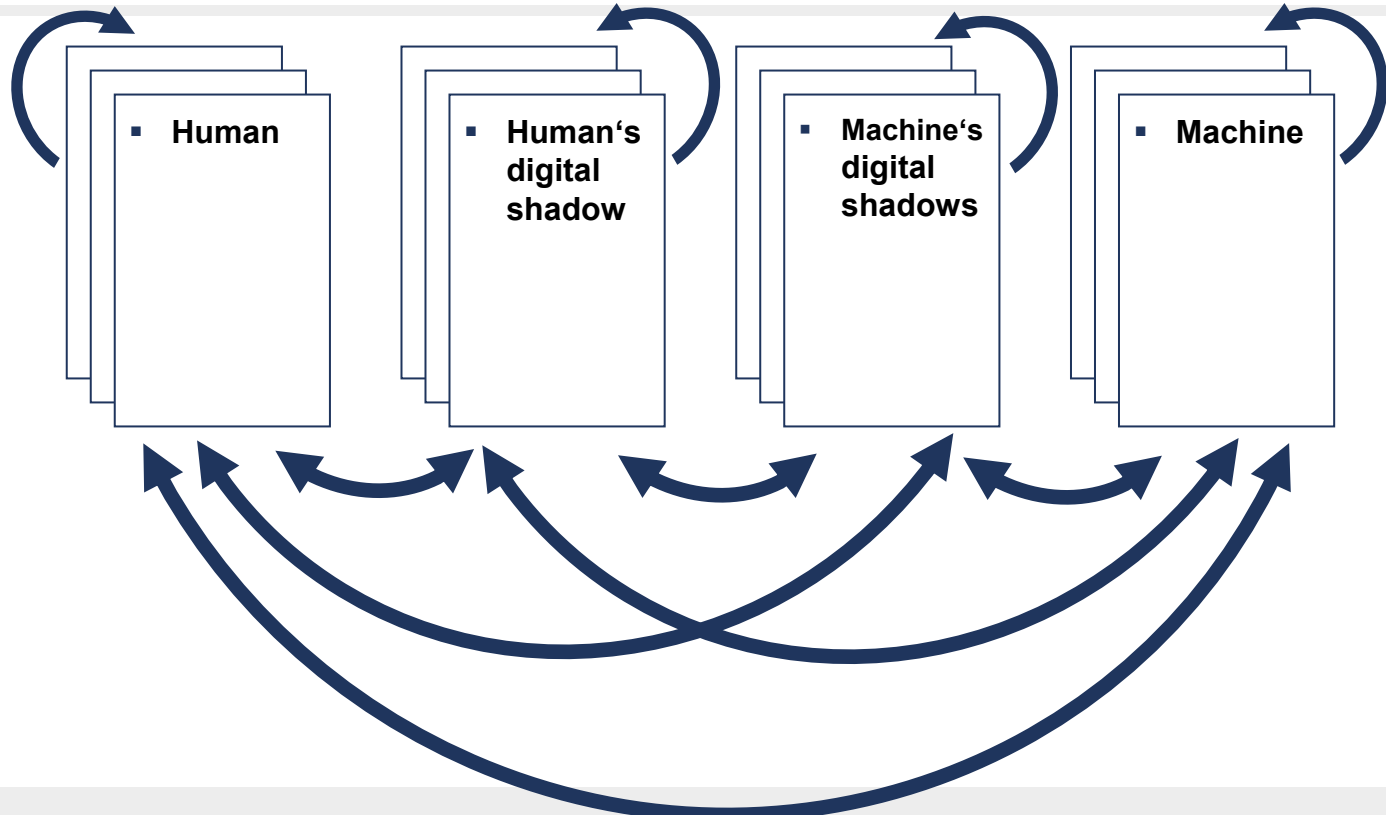
machines 2 humans



Pictures: <http://read-think-b4-u-write.blogspot.de/2014/04/digital-shadow-just-plain-creepy.html> & <https://unsplash.com/photos/wBfcPTEBiPI>, access: 28.11.2017

THE AGE OF HYBRID INTELLIGENCE

The Digital Shadow (Digital Skin) will become a dominant part of the technological and human identity



THE AGE OF HYBRID INTELLIGENCE

This new world has to be designed actively on the basis of our values – before it is irresponsibly designed by others.



On the long term, **all technical objects** in our world will become intelligent and will have their **own consciousness**.

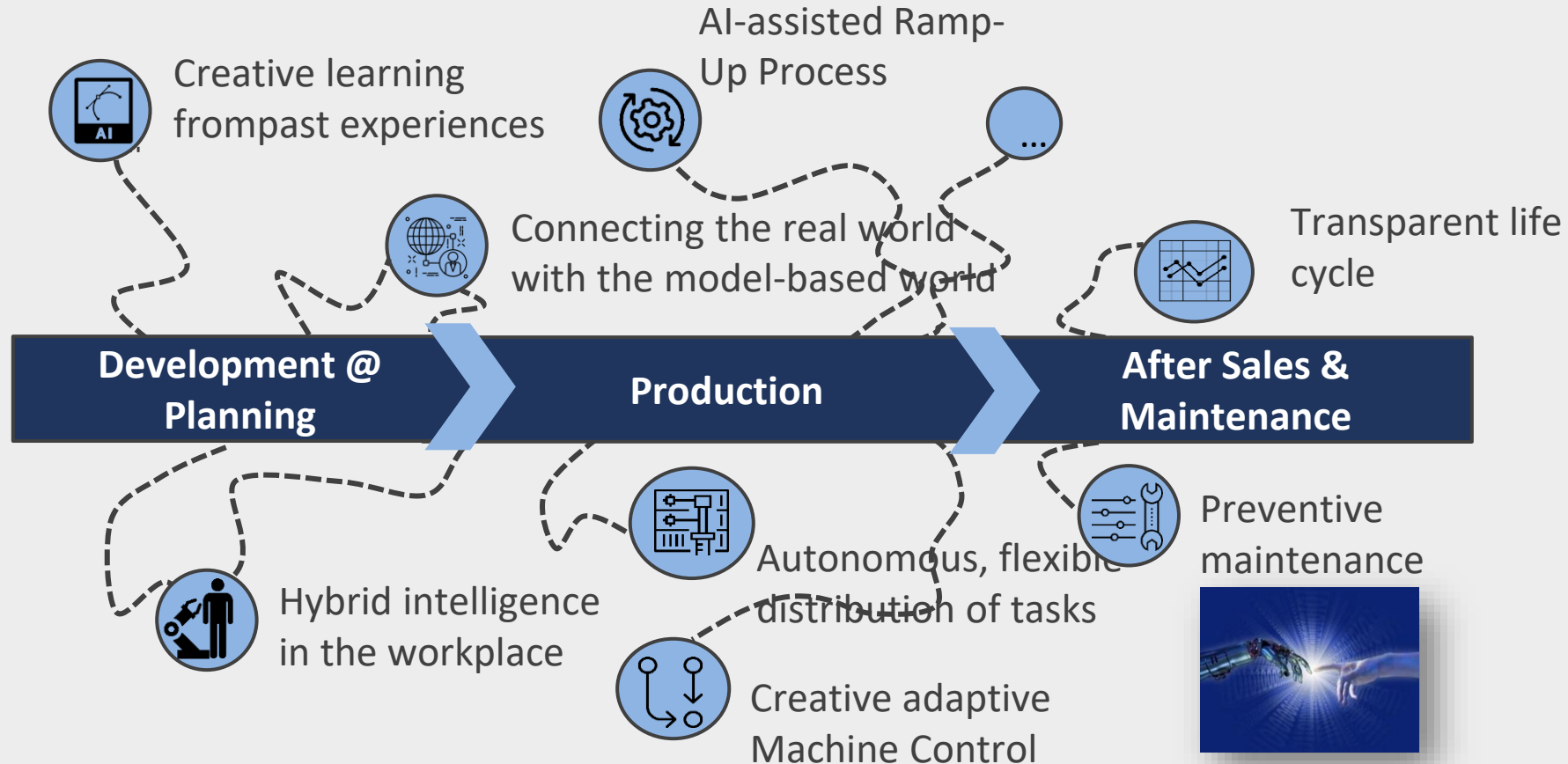


All essential technical objects will have a **life-long learning process, interacting with their “technical neighbors” and with humans**.



The **omnipresent and discreet interaction** between the digital shadows/twins of technology and humans will dominate all aspects of communication.

AI CREEPS INTO ALL PROCESSES ALONG THE VALUE CHAIN



Artificial Intelligence does not only change the “routine” jobs



Source: Cybernetics Lab, RWTH Aachen



White-collar jobs

... are under massive change due to the enhancement in AI, here the impact often hits “**middle-class jobs**”

Highly-qualified jobs

... as e.g. health professionals are already facing the taking over through AI in certain fields by Watson, Google Flu, etc.



Social robots

... will become capable of taking over even complex tasks with personal presence as in **health or home care**



Decentralized platforms

... with automated consensus models (e.g. blockchain) taking over complex administrative tasks e.g. in **controlling**



Autonomous systems

... as autonomous cars and more advanced production technology will **change the blue-collar jobs** – so it will for lowly-qualified jobs

Virtual and augmented environments

... allowing **new international players**, even in tasks requiring humans and presence

THE AGE OF HYBRID INTELLIGENCE

What does that mean for the digital landscape?

Source: Gartner, Made in Germany

Intelligence everywhere

- Artificial Intelligence and Advanced Machine Learning
- Intelligent Apps
- Intelligent Things

Connecting physical and digital world

- Virtual and Augmented Reality
- Digital Twins
- Blockchain and Distributed Ledgers
- Conversation Systems

Digital Infrastructure

- Mesh App and Service Architecture
- Digital Technology Platforms (Information, customer experience, analytics and intelligence, internet of things) Business Ecosystems
- Adaptive Security Architecture

Artificial Intelligence changes the field von jurisprudence

!

New questions concerning insurances, laws and ethics occur with the occurrence of autonomous cars, medical robots etc.



!

New questions concerning intellectual properties occur due to the speed of innovation and digitalization of information, new rules for open source etc.



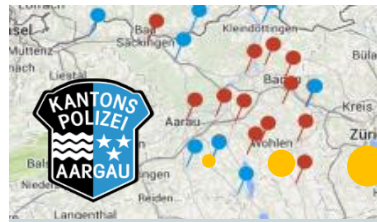
!

A new design for Society with AI
Intelligent machines with own consciousness must become an own legal personality with special laws

Artificial Intelligence requires new political and ethical standards



Predictive policing:
burglary pre-diagnostic



Predictive policing:
crime-alert agent

Is the intention to
commit a crime
already a crime?



A new design for Society with AI

Intelligent machines with own consciousness must become an own legal personality with special laws



Cars with morality: collision
optimization

Algorithms do – so far –
not design themselves.
Which legal structure and which
ethical codex are they based on?

Artificial Intelligence created avatars as simulated reality

This is the avatar of Sedar Soares, created 19 years after his murder in order to finally find his killer. Politie Eenheid Rotterdam/Youtube



Digital avatars of the victims help to identify crims



A new design for Society AI

Digital Avatars reconstruct the identity of a person. How long are they allowed to exist?

The simulated reality of avatars is more and more received as reality and no longer as virtuality. This raises up serious questions: What is the Identity of a human being? What is reality? What ist truth?

Source: Die Zeit – 42/2025 – 01.10.2025

<https://www.zeit.de/2025/42/ki-strafverfolgung-polizei-avatar-bka-ermittlung/komplettansicht>

What's next for AI development?

- 1. From reactive models to autonomous agents**
- 2. Multimodality:** AI combines text, images, audio, video, and sensors
- 3. Domain-specific and integrated models** (healthcare, finance, industry)
- 4. AI will be embedded in existing applications**
 - not as a separate tool, but as an integrated part
- 5. Focus on values, ethics, sustainability, and control of the hybrid intelligence**
- 6. AI as a daily companion and co-creator**

We have to design hybrid intelligence in a positive way, before others do it without responsibility.

System border of nations, public administration systems, companies, institutions of all kinds (e.g. churches, non-profit organizations) will change dramatically under the influence of Artificial Intelligence.

Democratic principles and structures – i.e. on the basis of the social market economy or the model of democracy – have to be implemented into the systems of Artificial Intelligence.

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How Artificial Intelligence is
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