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Bern University of Applied Sciences



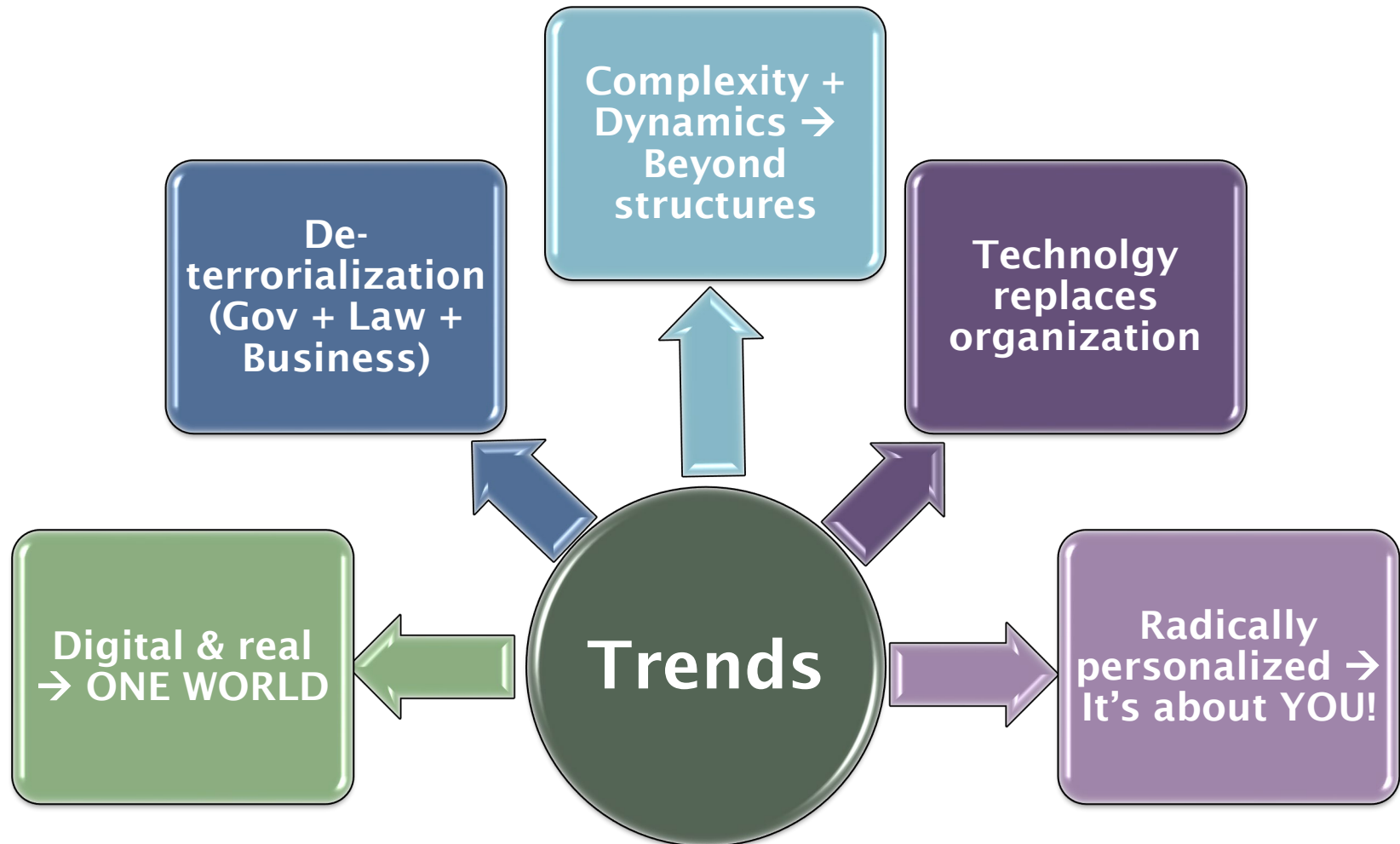
Digital transformation – from the usage of tools to the creation of new tools

Prof. Dr. Reinhard Riedl
BFH-Center Digital Society

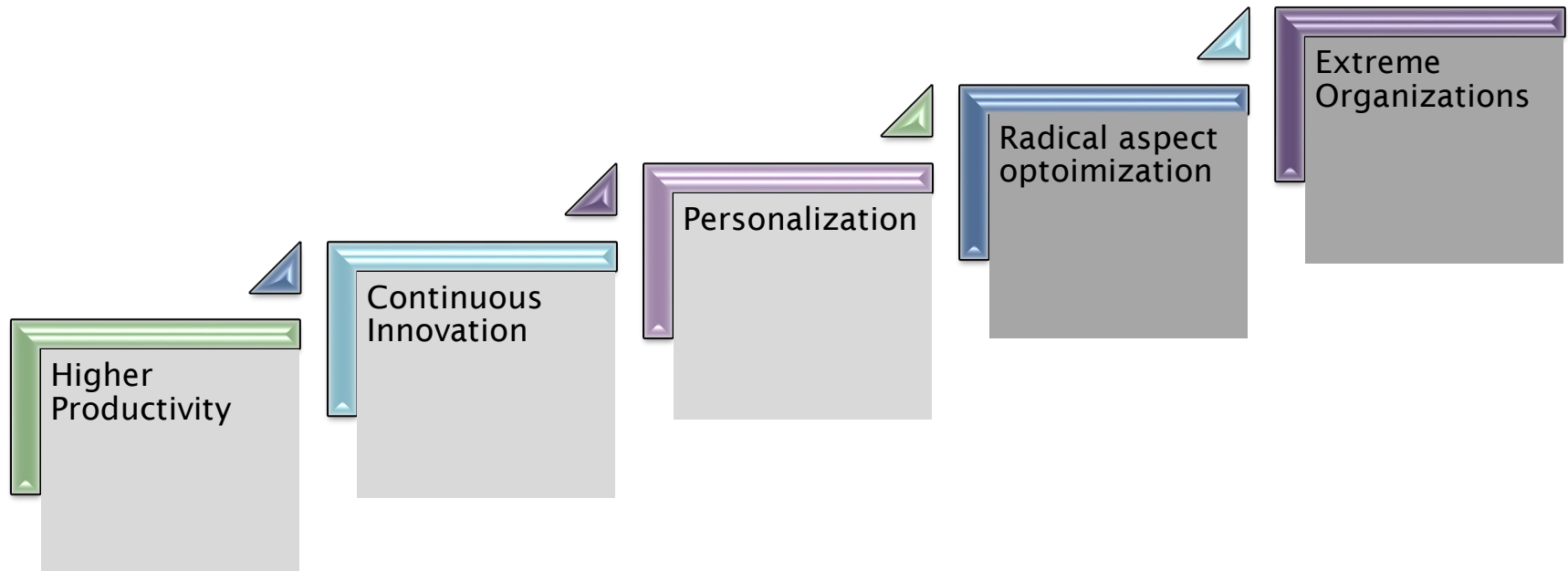
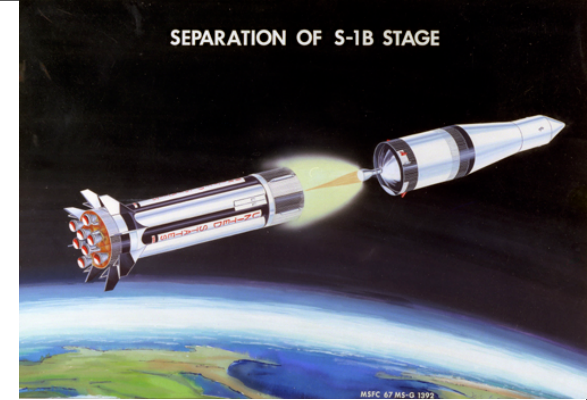
Why bother at all???

Alphabet, Apple, Fabasoft & Co
(or US mission driven research)
will give us,
what we need!

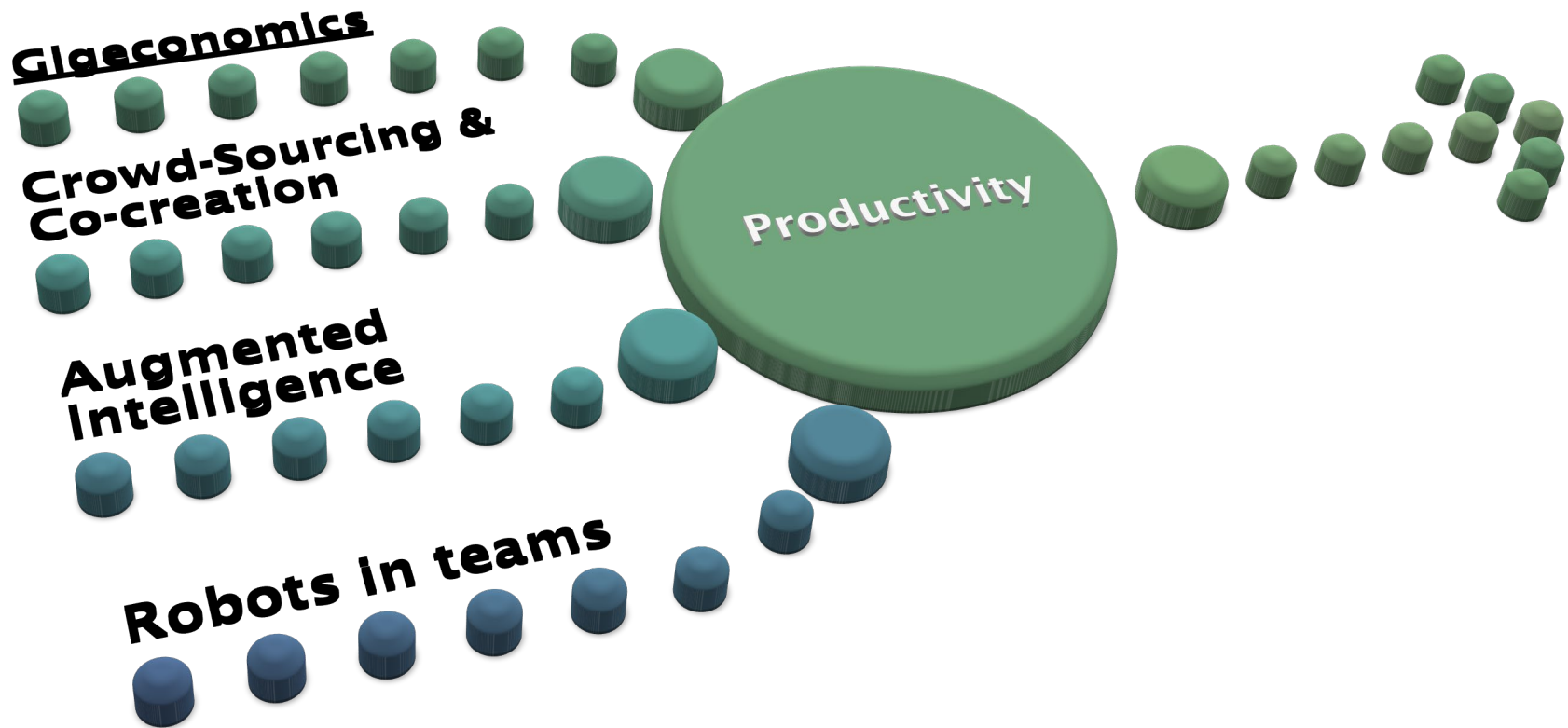
5 Trends are changing the world



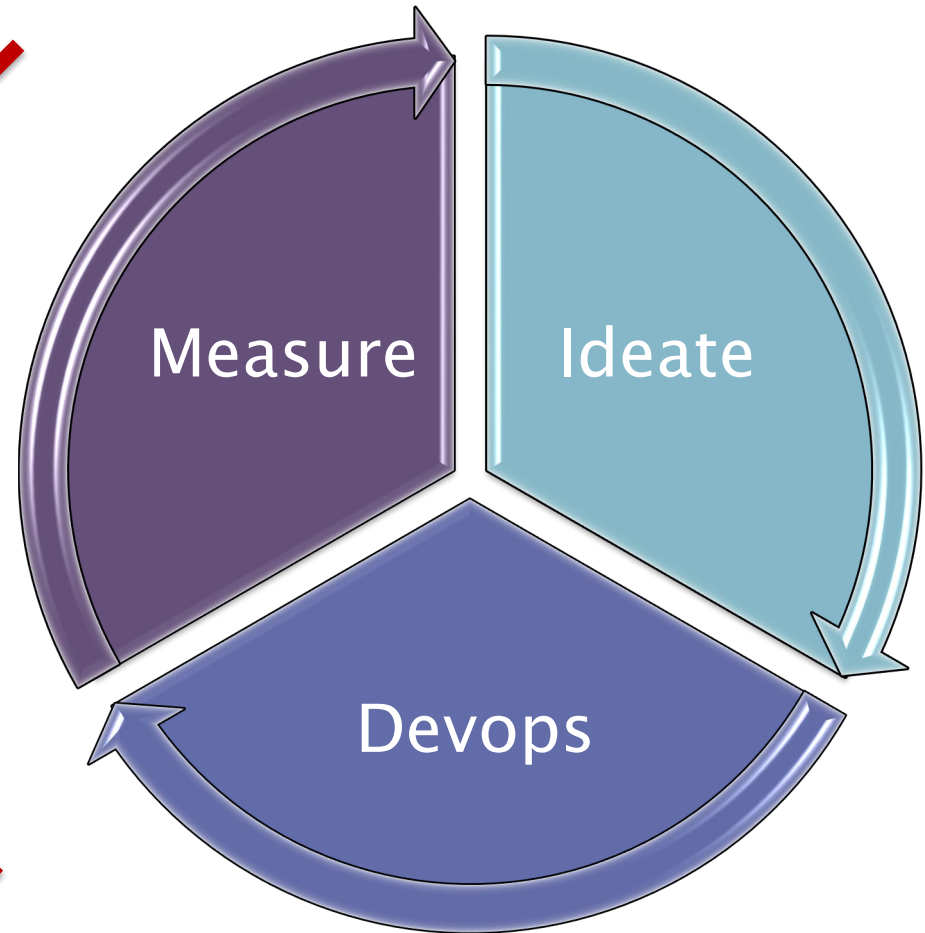
The digitalization rocket will burn 5 stages



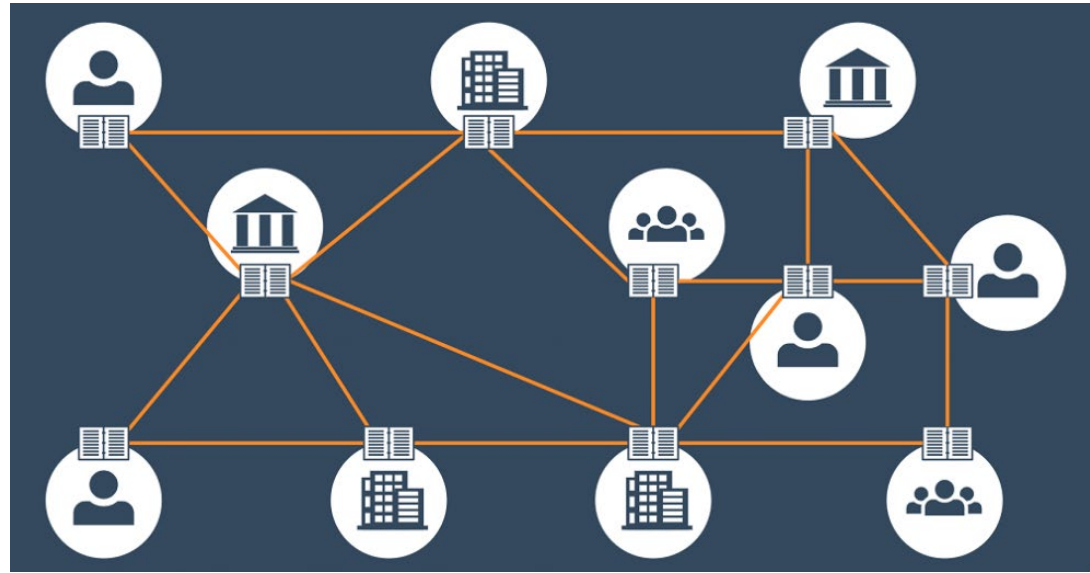
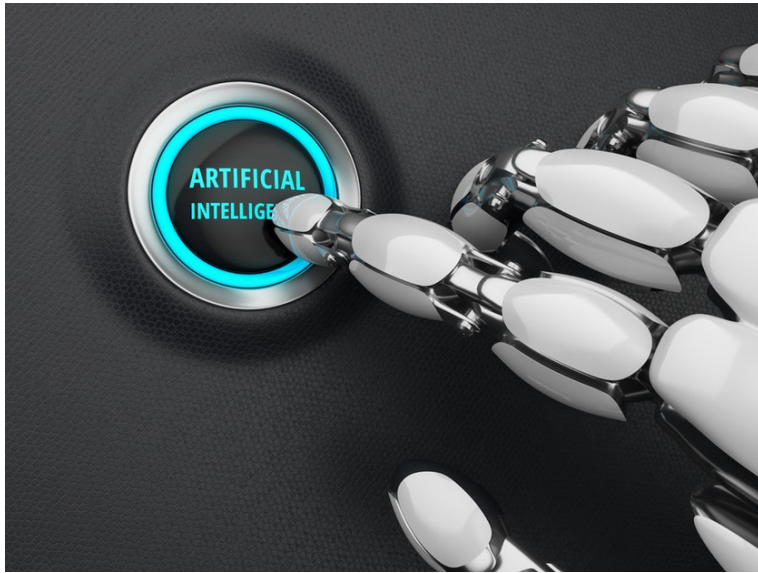
New resources improve productivity



Continuous innovation will replace in parts the «big things»

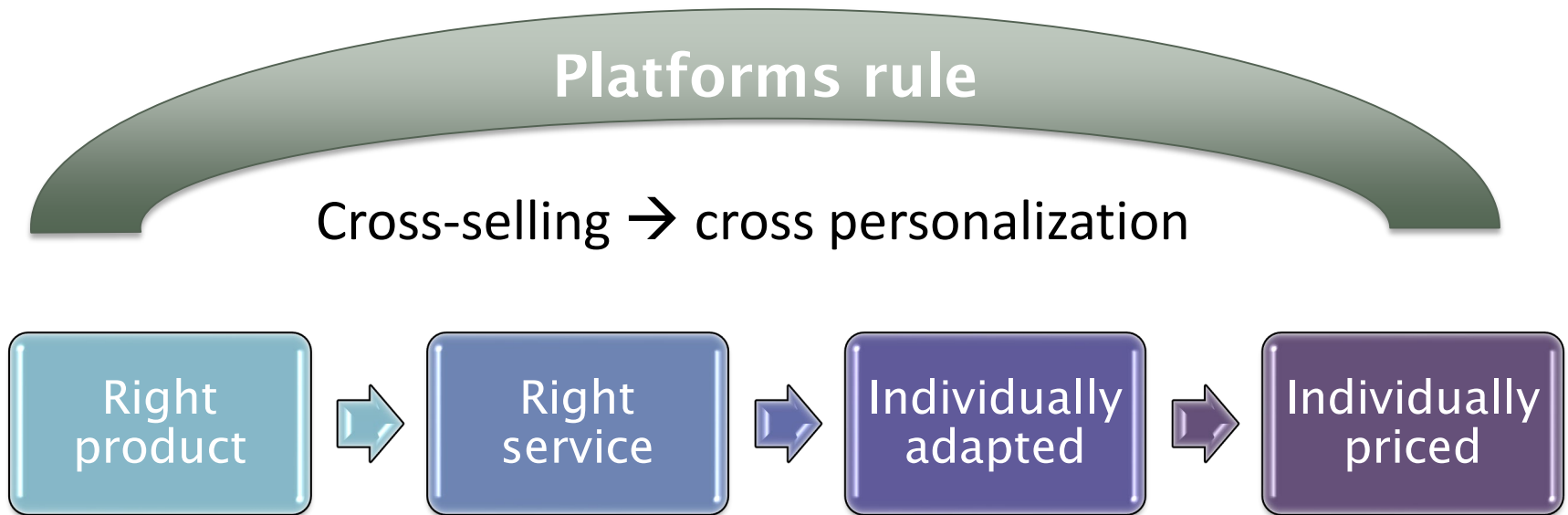


The only big things will be technologies created by communities



... as part of sociotechnological movements.

Radical personalization & discrimination improve the value for customers / customer value



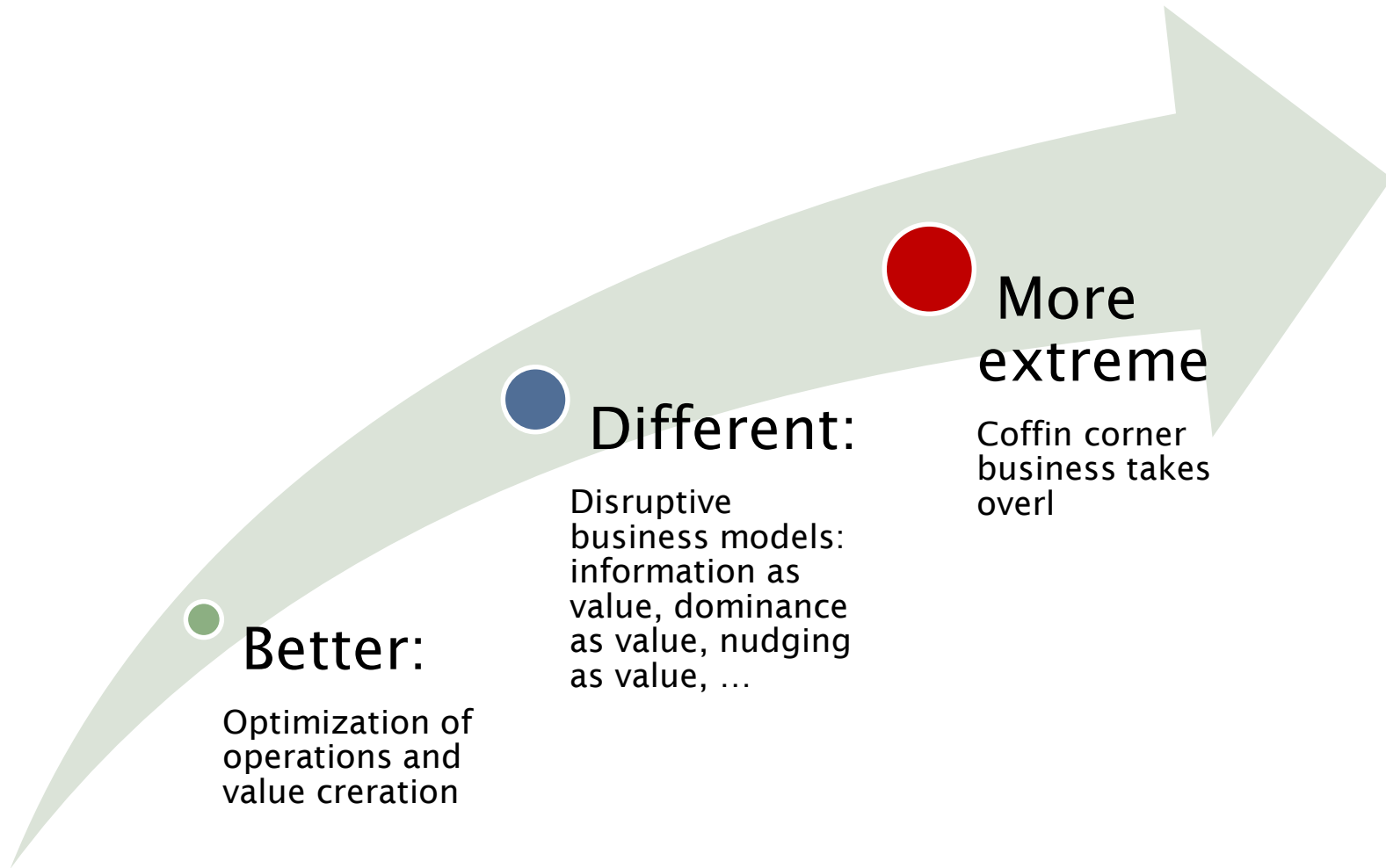
The «other» return of Wittgenstein: Aspect seeing → aspect optimization

- Everything and everybody is digitally twinned: machines, men, and actions
- Simulation is the name of the new game – even in Democracy!



<https://www.it-production.com/produktentwicklung/nc-simulation-digitale-zwillinge-cnc/>

The markets will be transformed



Innovators

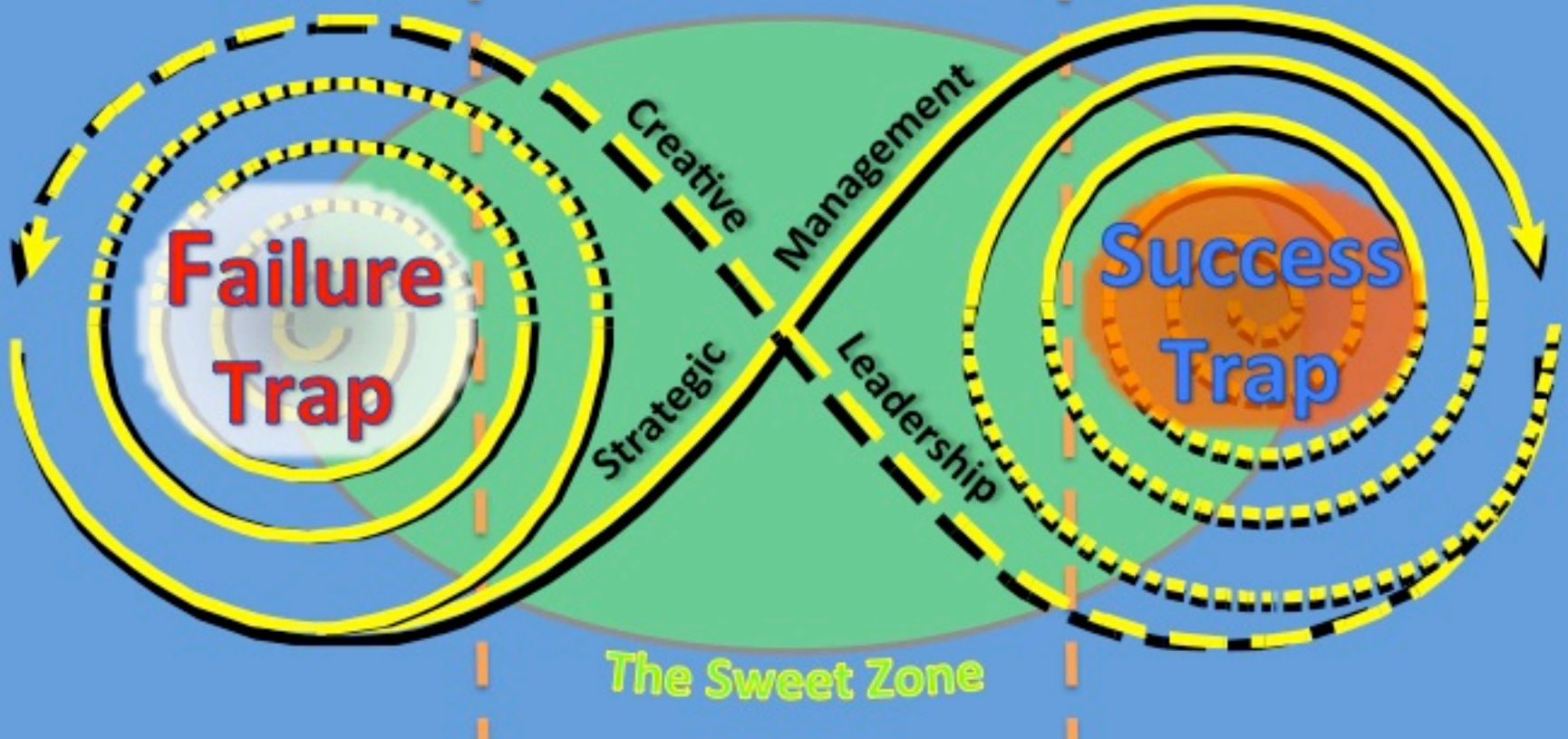
Managers & Leaders

Administrators

Counter-intuitive:
Cockpits!!!

Counter-intuitive:
Networks

*Sustainable
Future*



Coffin corners turn into borderline sweet zones!

Domains for borderline sweet zones

Extreme competitiveness (Swissair style)

Extreme social orientation

Forever startup

Extreme resource optimization

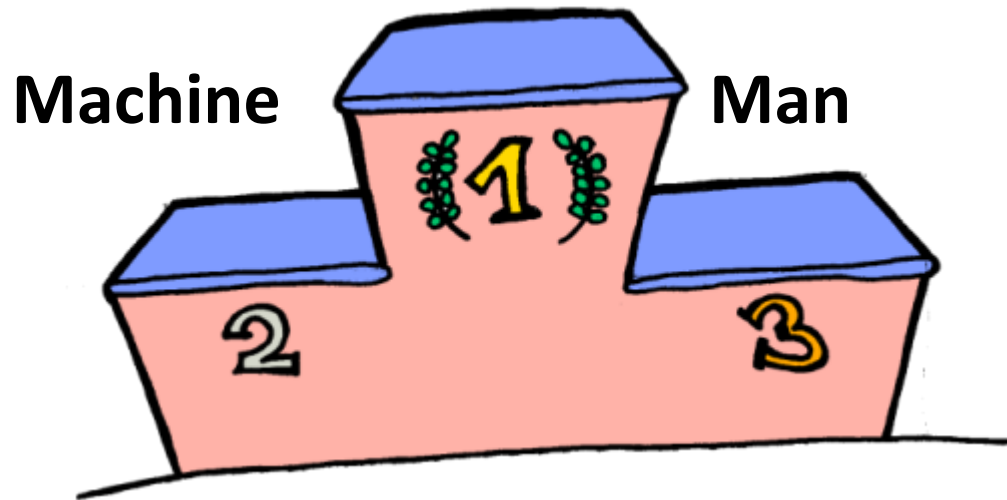
Radical value orientation (exp orgs)

Hardly anything works without humans –
even DAOs living on distributed ledgers are not run
successfully without humans ...



Competition man against machine in the discipline: «fixed context with experience»

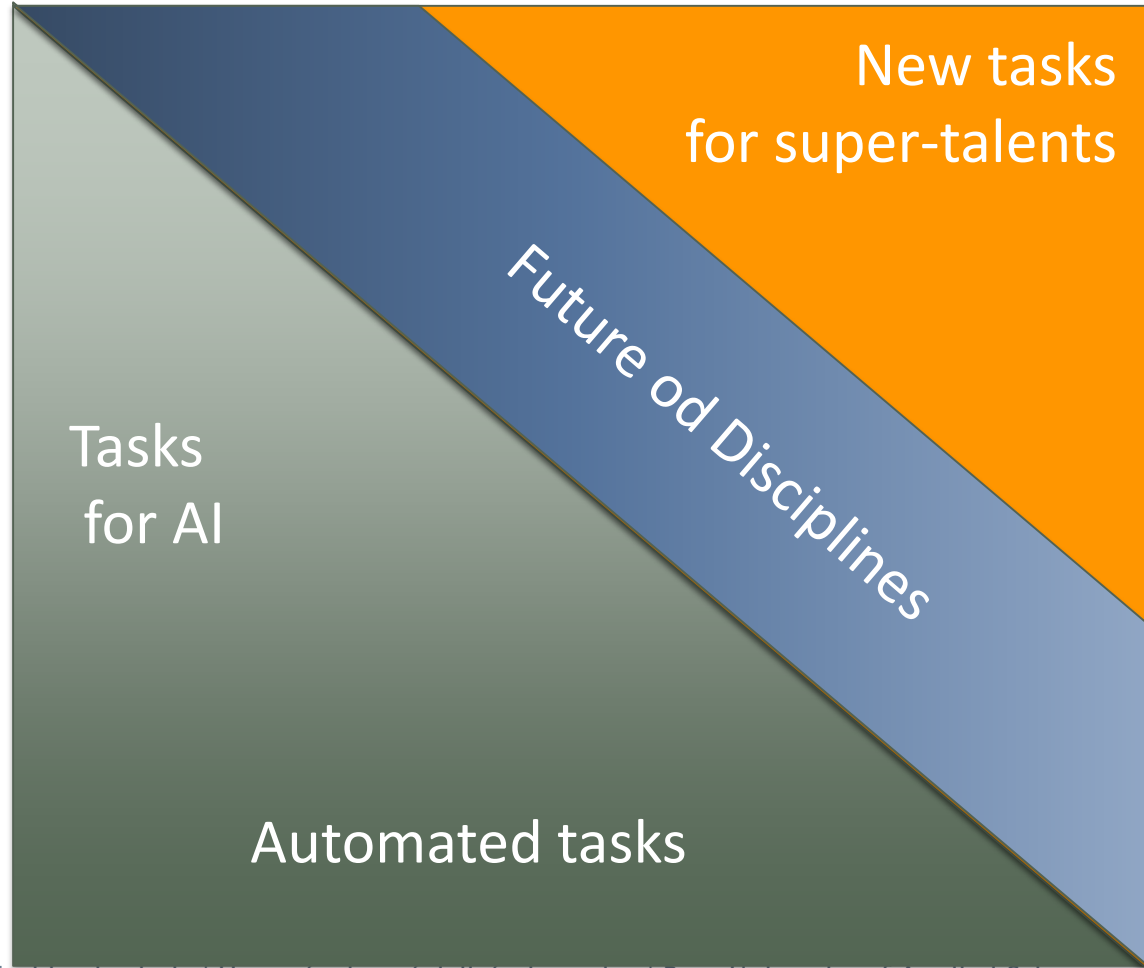
Men & Machine



In all situations **with defined context and recorded good practice!**

The tasks for humans change

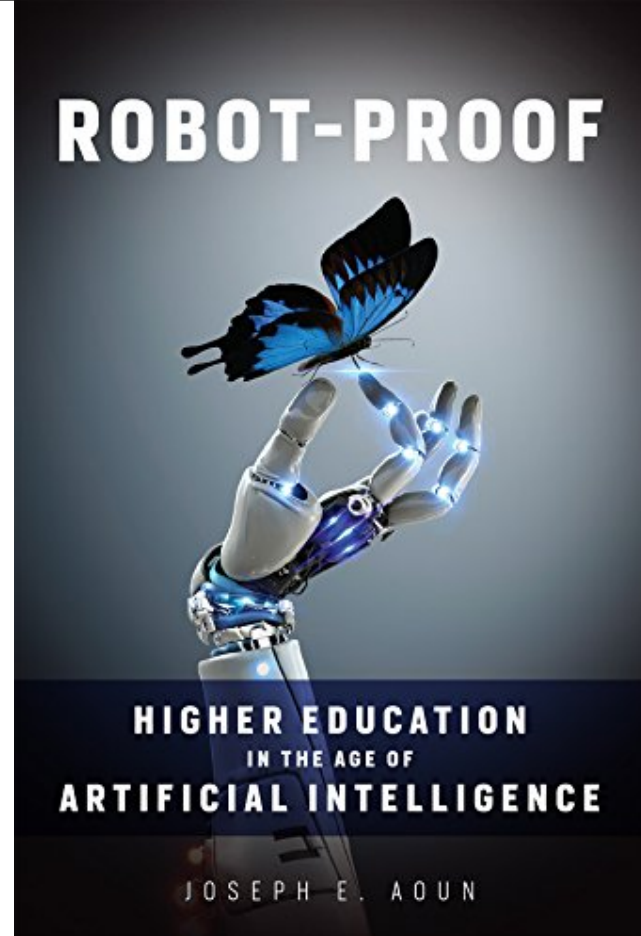
Complexity



Uniqueness

Higher education has to adapt

- See e.g. Aoun's list of key competencies
 - Technological literacy
 - Data literacy
 - Human literacy
 - Critical thinking
 - System thinking
 - Entrepreneurship
 - Cultural agility



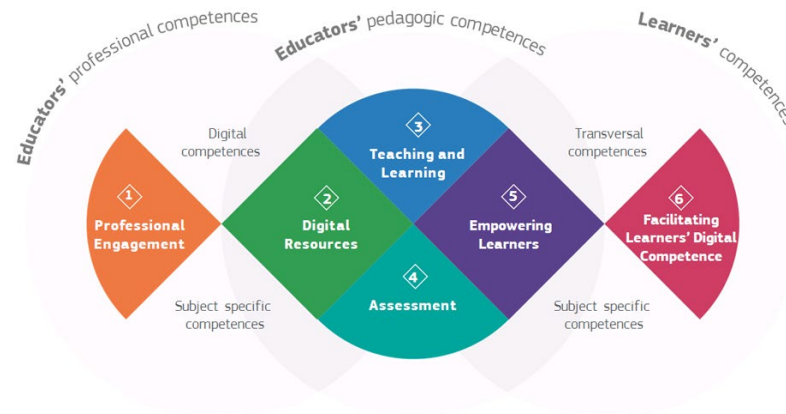
Digital transformation requires

Humans capable of computational thinking

- *Knowledge of the ICT potential*
 - *Appropriation of ICT tools*
 - *Implementation skills*

European digital competence framework

- Information & data literacy
- Communication & collaboration
- Digital content creation
- Safety
- Problem solving



Mathematics plays a key role in future disciplinary work

- Criminal investigations
- Forecasts
- Security
- Strategy work



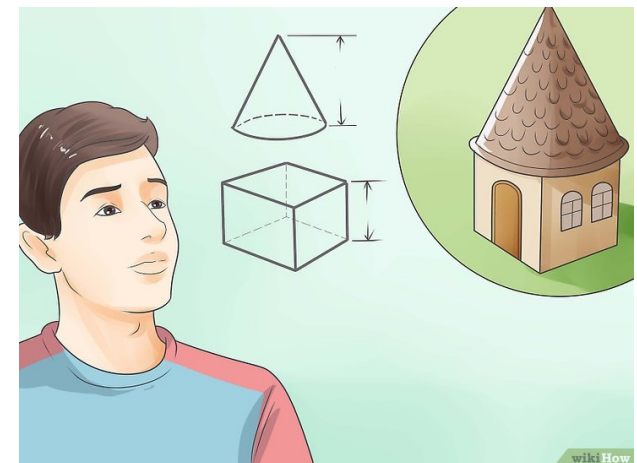
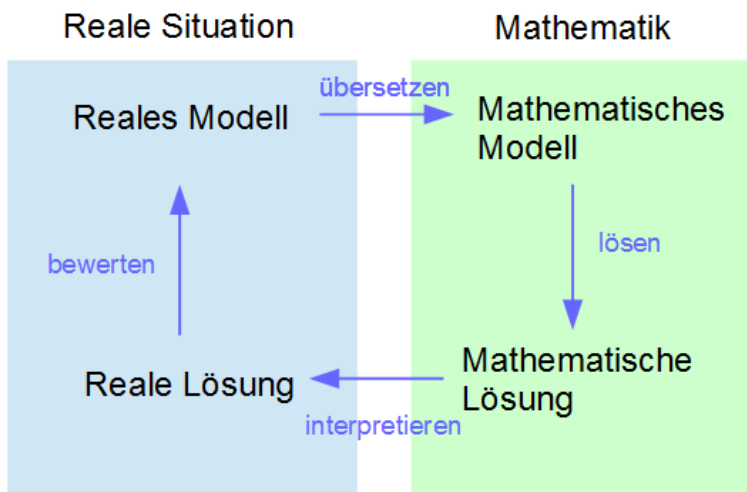
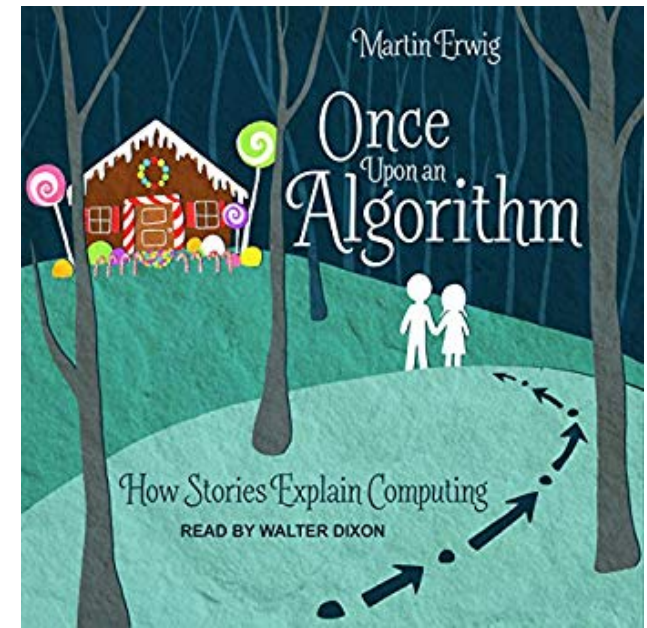
Algorithms are key

- They do not only work in baseball, they even improve common sense practice
 - Purchasing
 - Organizing
 - Selecting team members
 - Search for the missing
 - ... including missing information



Mathematics is the «design science» supporting computational thinking

- Designing models
- Designing algorithms
- Designing the procurement of data
- Designing the code
- Designing the business
- Designing the business optimization



Valueable applications of
mathematics and computer science
emerge from the **DIALOGUE**
between **SCIENCE** and **BUSINESS!**

There is no translation
from science into business
beyond boundary objects!

Appropriating basic digital tools in business

Managing organizational IT-maturity

Resetting expectations, structures, and narratives

Hype surfing

Cleaning, curating and valorizing data

Using AI & robots in low & high profile contexts

Creating and implementing digital business models

Developing platforms and ecosystems

Crowding and Co-creating

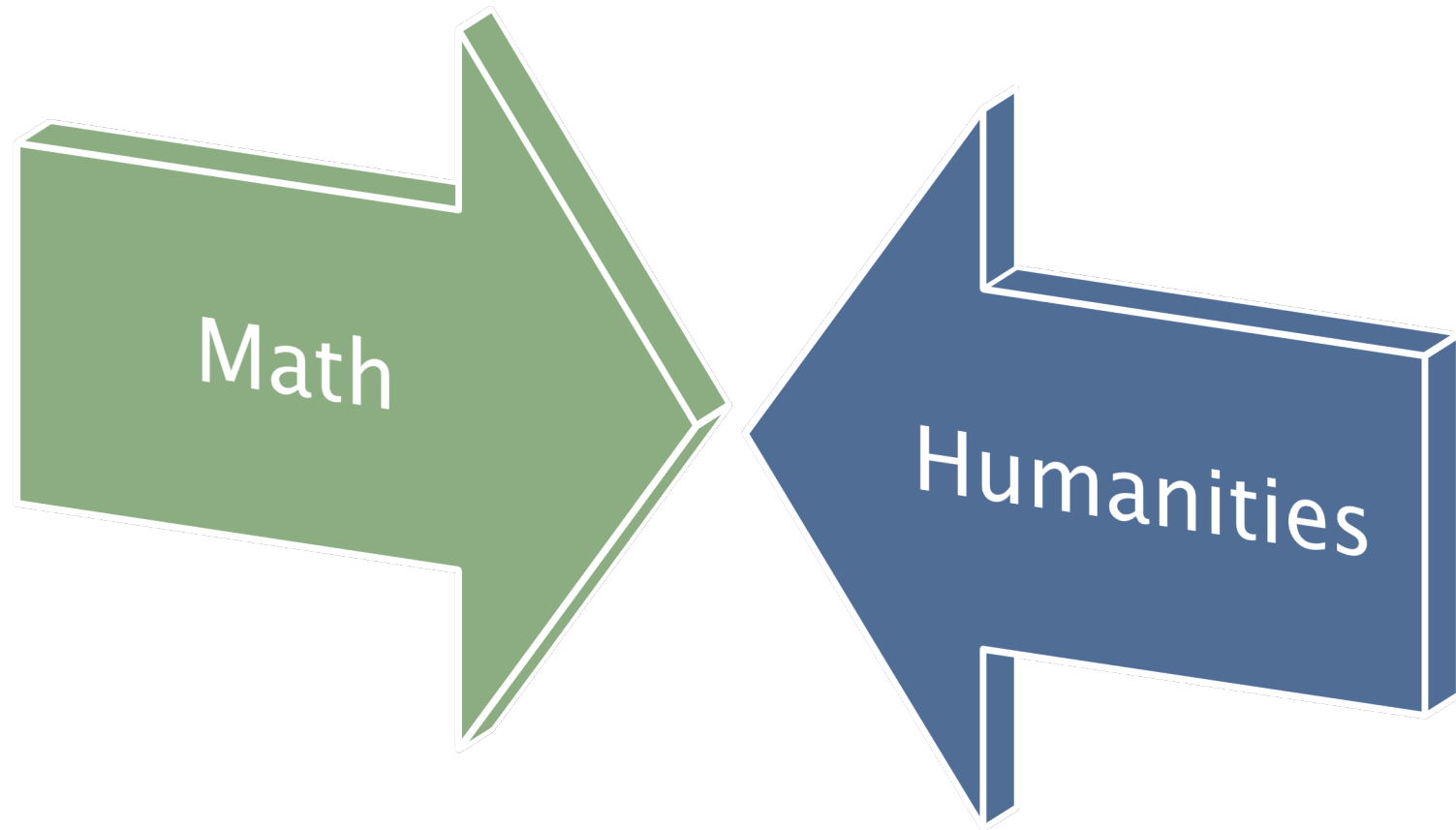
Creating new digital tools

We need **speed & focus**:

ICT → configuration to enable appropriation

Disciplines → coding for specific needs

Formal and traditional philosophy are the corner stones of computational business thinking



**The 11th digital business skill is
“identifying options / freedom & looking beyond the horizon”**

The reality is highly diverse ...

Some IT departments fail to adapt to the increased innovation speed of the business departments

Some CTO teams fail to contribute innovation ideas to the business departments

Some business departments fail to exploit data resources

Some management teams fail to understand chances and threats of technological progress

Some boards fail to set up a proper governance measures

Some countries fail to set up collaboration of government agencies

**Be careful:
Observations may mislead us!**

Phase transitions fake stability

Guillaume Paoli

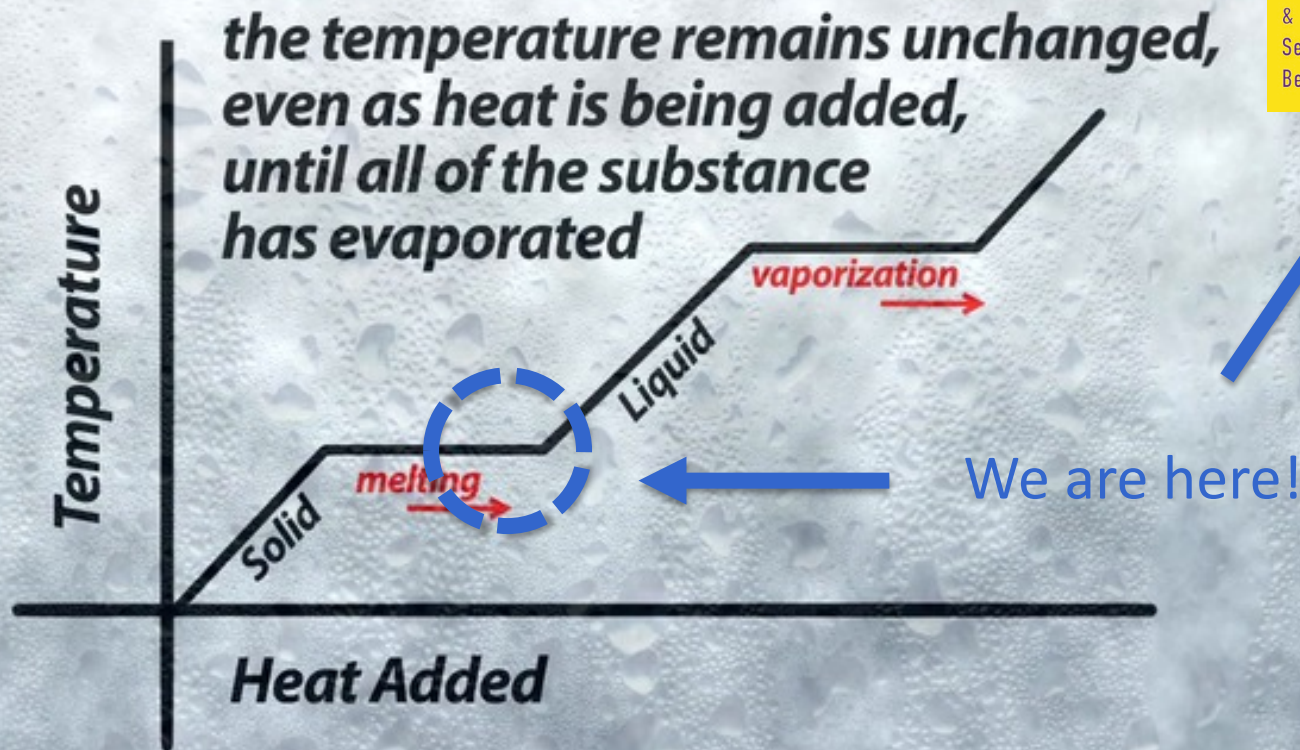
Die lange Nacht
der Metamorphose

Über die
Gentrifizierung
der Kultur

Matthes
&
Seitz
Berlin

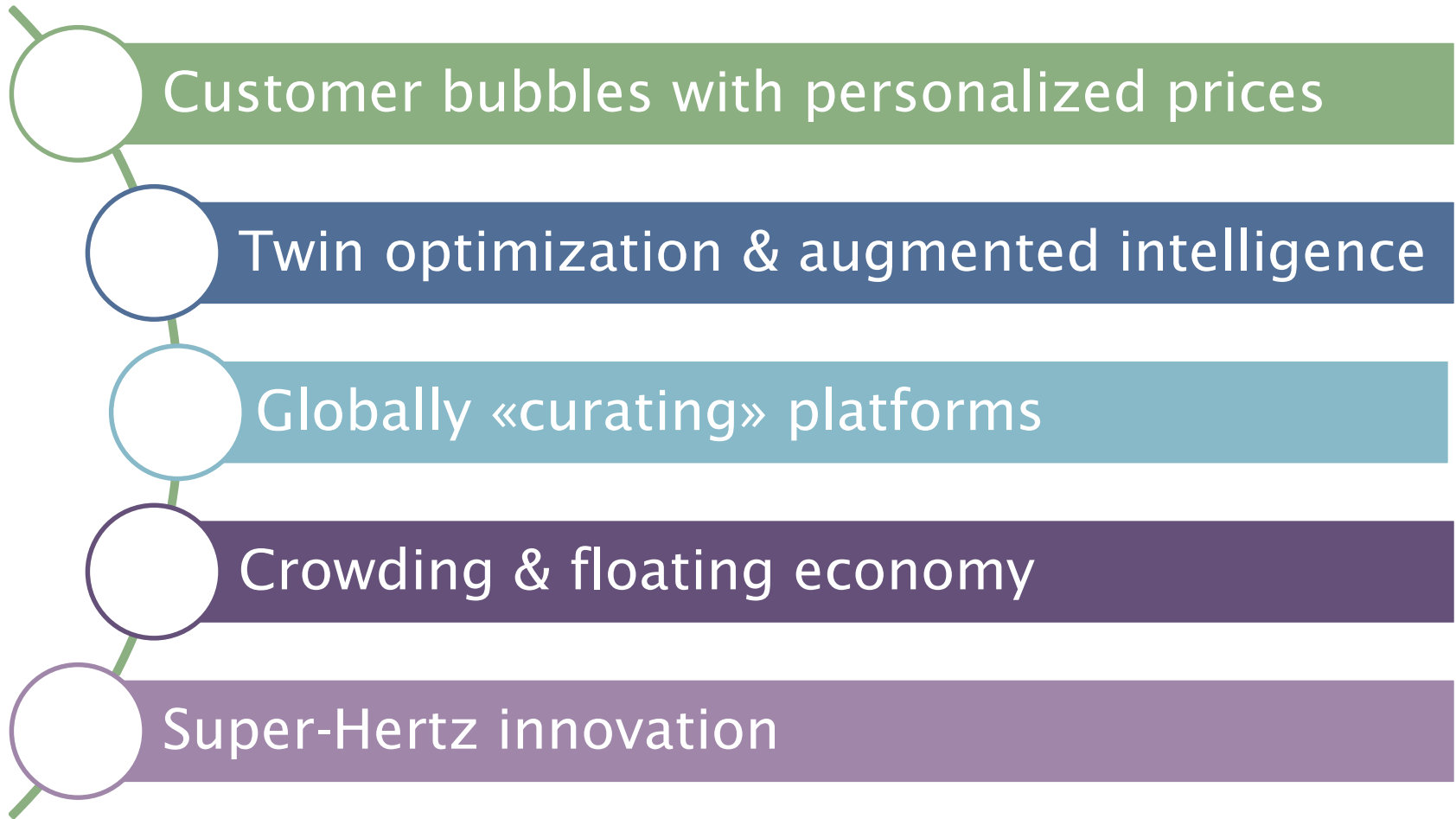


INTERPRETING THE CURVE: HEATING



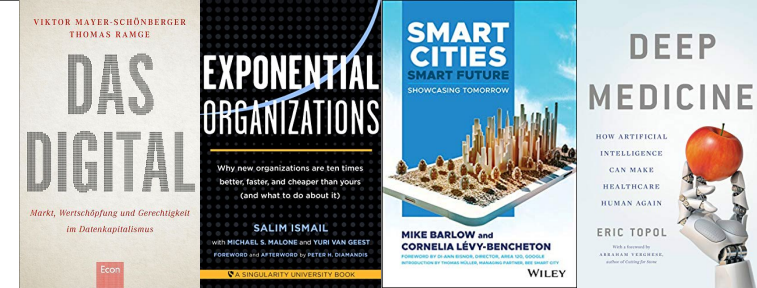
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The «liquid phase» will bring the expected ...

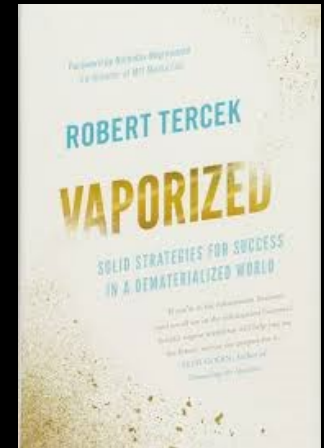


Some implications ...

- I. Basic digitals are mandatory (e.g. ECDL)
- II. Permanent learning is a must
- III. Recurring changes of tasks are normal
- IV. Advanced digital skills are key in higher education
- V. The next generation of CIOs will be computer scientists
- VI. Disciplinary communities provide identity
- VII. Values push exponential organizations
- VIII. Companies may lose legitimation



**The vaporized phase
is just speculation**



Educated guess:
**All business models vaporize quickly,
but neither at the same time
nor immediately after creation!**



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Merci!

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BFH-Center Digital Society



- ▶ **The WHY:** The digital transformation shall be an *enabler* for people, disciplines, business, and government!

- ▶ **The HOW:** We help actors to *speed up the appropriation of digital tools!*

- ▶ **The WHAT:**
 - ▶ Methods: **sustainable design & applied data science**
 - ▶ Topics: **Identity, privacy, and cybersecurity**
 - ▶ Areas: **digital health & smart cities**

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