Safe and Trusted Human Centric Artificial Intelligence in Future Manufacturing Lines

STAIR

www.star-ai.eu

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°956573

AI in Manufacturing, That Works

The Symbiosis of Functionals & Non-Functionals as Main Succes Factor

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Arthur's Legal, Strategies & Systems

the global strategic legal firm & knowledge partner & consortium partner of project **STAR-AI**

Expert Advisor to European Commission, Governments & Private Sector (Societal Challenges, Digital, IoT & Autonomous Ecosystems, Data, Cybersecurity, Privacy & New Trust)

Advisory Board Member & Consortium Partner of 15+ European Projects on Societal Challenges, Green, Digital, Cyber, IoT, AI, Resilience, Data, Ethics, Sovereignty & Trust

Founding Member Alliance for IoT Innovation (AIOTI), Co-Chair Policy Working Group, and Leader Security & Privacy in IoT Taskforce

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Arthur's Legal, Strategies & Systems, with its headquarters in Amsterdam

the global strategic legal firm & knowledge partner & consortium partner of project **STAR-AI**

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The Three Pillars

‘A Union of vitality in the world of fragility’

Repairing the world of today by shaping the world of tomorrow

Aka (Post-)Pandemic & Next Generation Value Creation

More Green

More Digital

More Resilient

The Commission Work Programme for 2020 ‘mapped out our vision of building a fairer, healthier, greener and more digital society. While many things have changed in the last year, that ambition remains our driving force for the year ahead.’

‘Changes in climate, digital technologies and geopolitics were already profoundly affecting our society and driving our agenda. However, the pandemic has sharpened the need for Europe to lead the twin green and digital transitions and make its societies and economies more resilient. This creates an unparalleled opportunity to move out of the fragility of the crisis by creating a new vitality for our Union.’

https://ec.europa.eu/info/publications/2021-commission-work-programme-key-documents_en

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Intertwined Societal Challenges

It is not hard to make decisions once you know what the various values are

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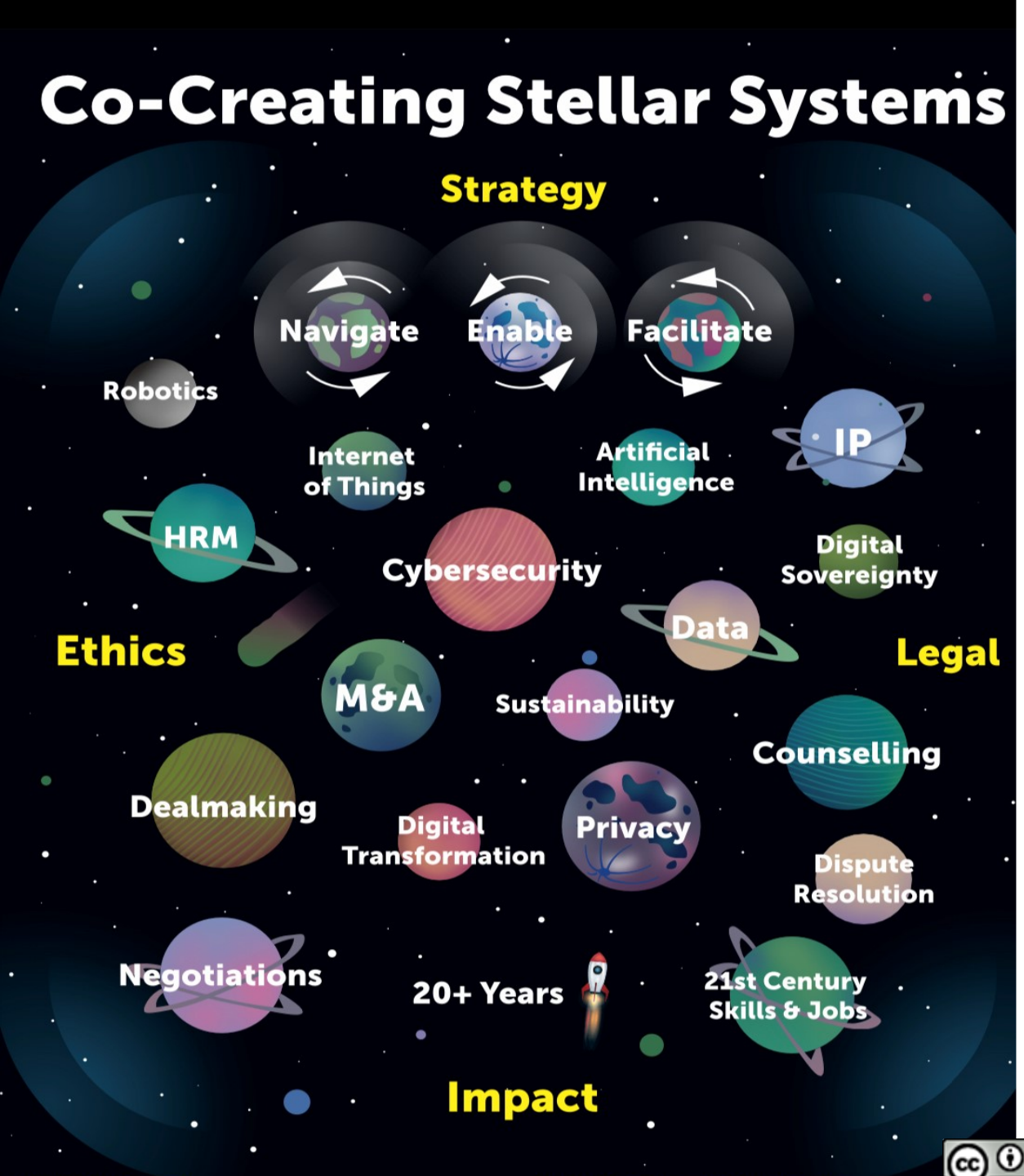
Co-Creating Stellar Systems



InterTwined Ecosystems

Powered by Purpose & Passion

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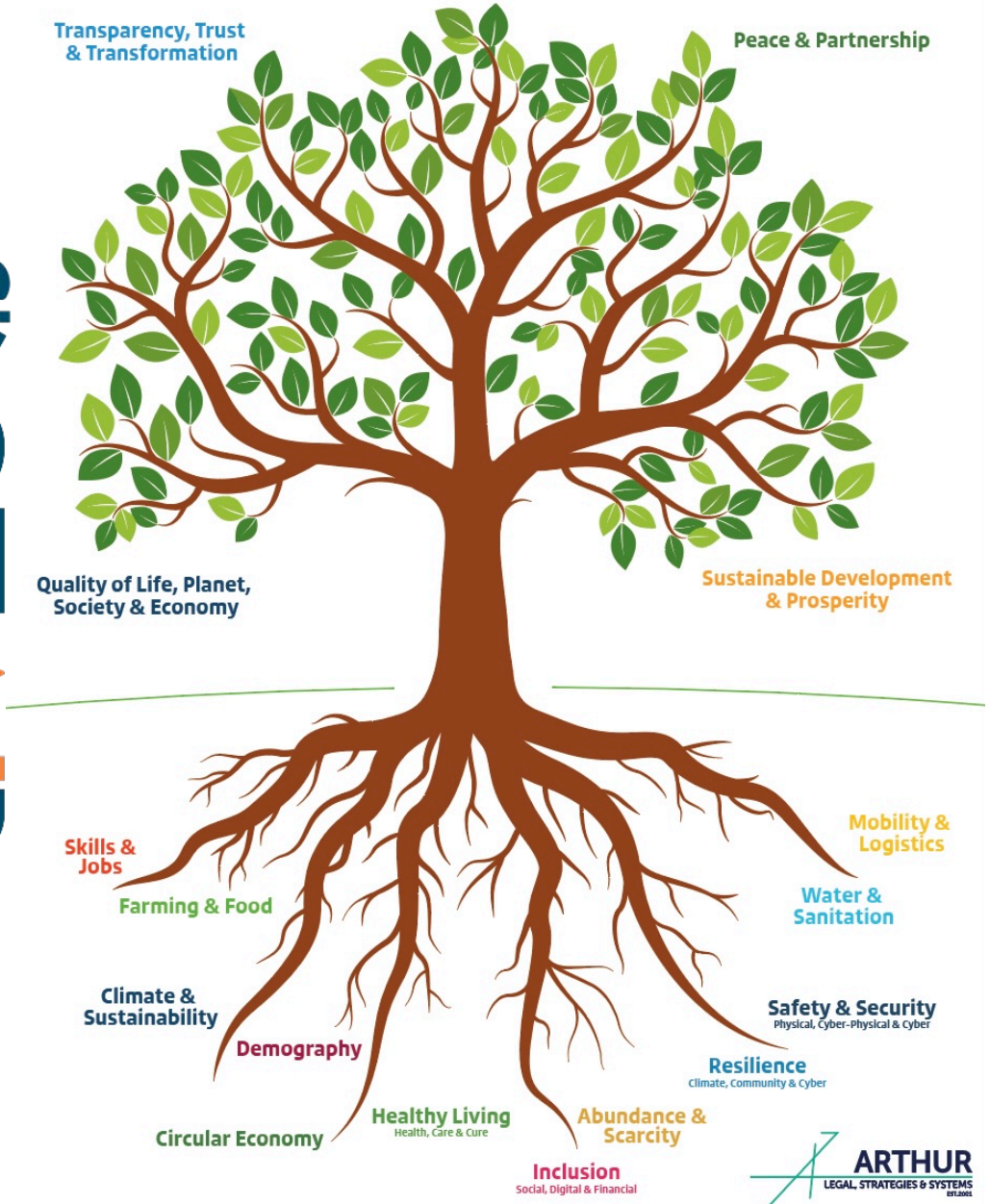

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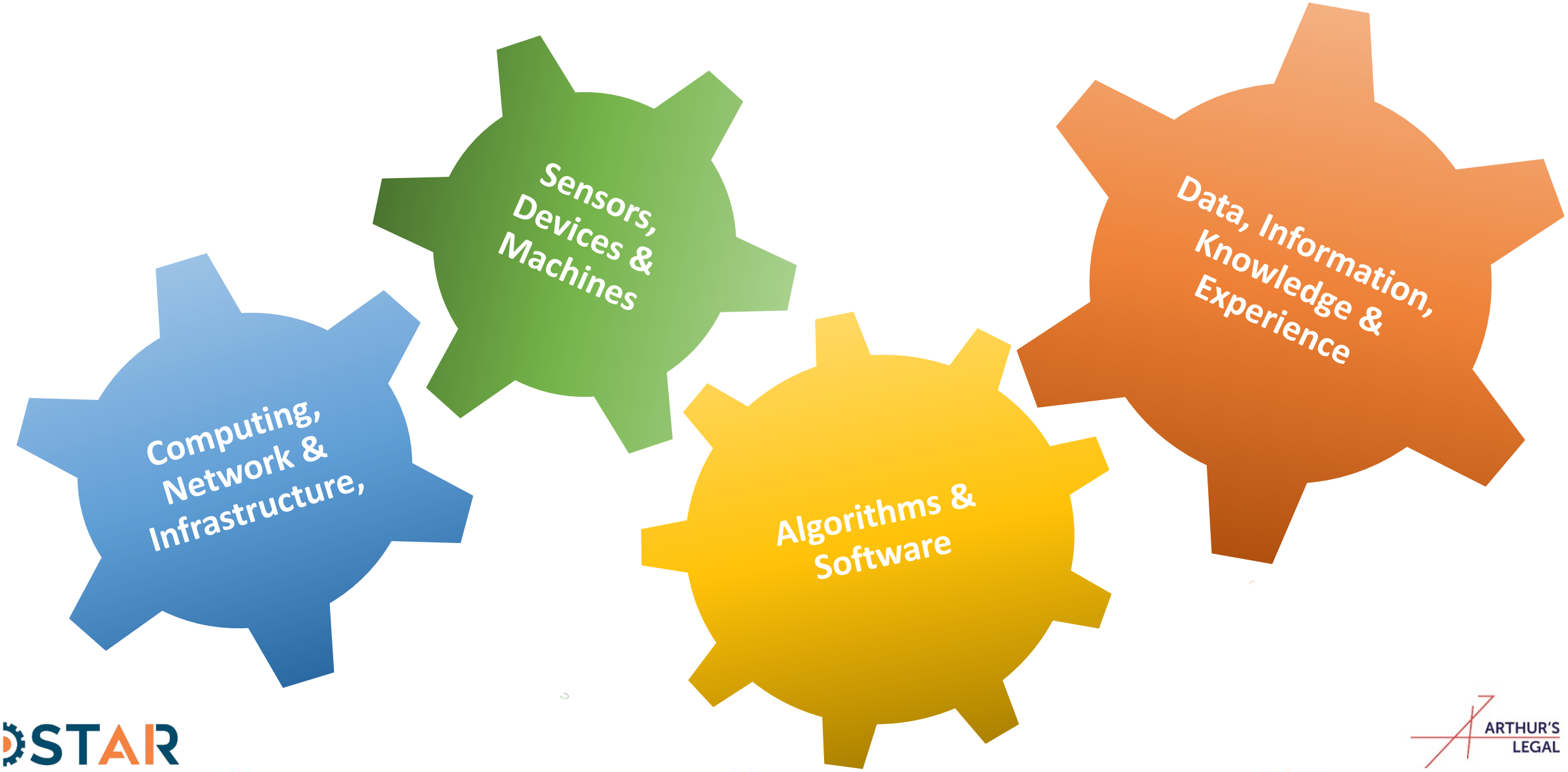
Digital Ecosystems: Technical Stack + Data



Stand-Alone

Connectivity

Inter-Connectivity

Hyper-Connectivity

Does it work?

Or do the manufacturing and supporting systems only function?

What if it does not function?

#Just An Afterthought?

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Ethics & Rule of Law Dimensions

1. Ethics
2. Behaviour
3. Responsibility
4. Accountability
5. Liability
6. Redress & Remedies
7. Reputation

To be plotted & mapped, per STAR-AI Pilot

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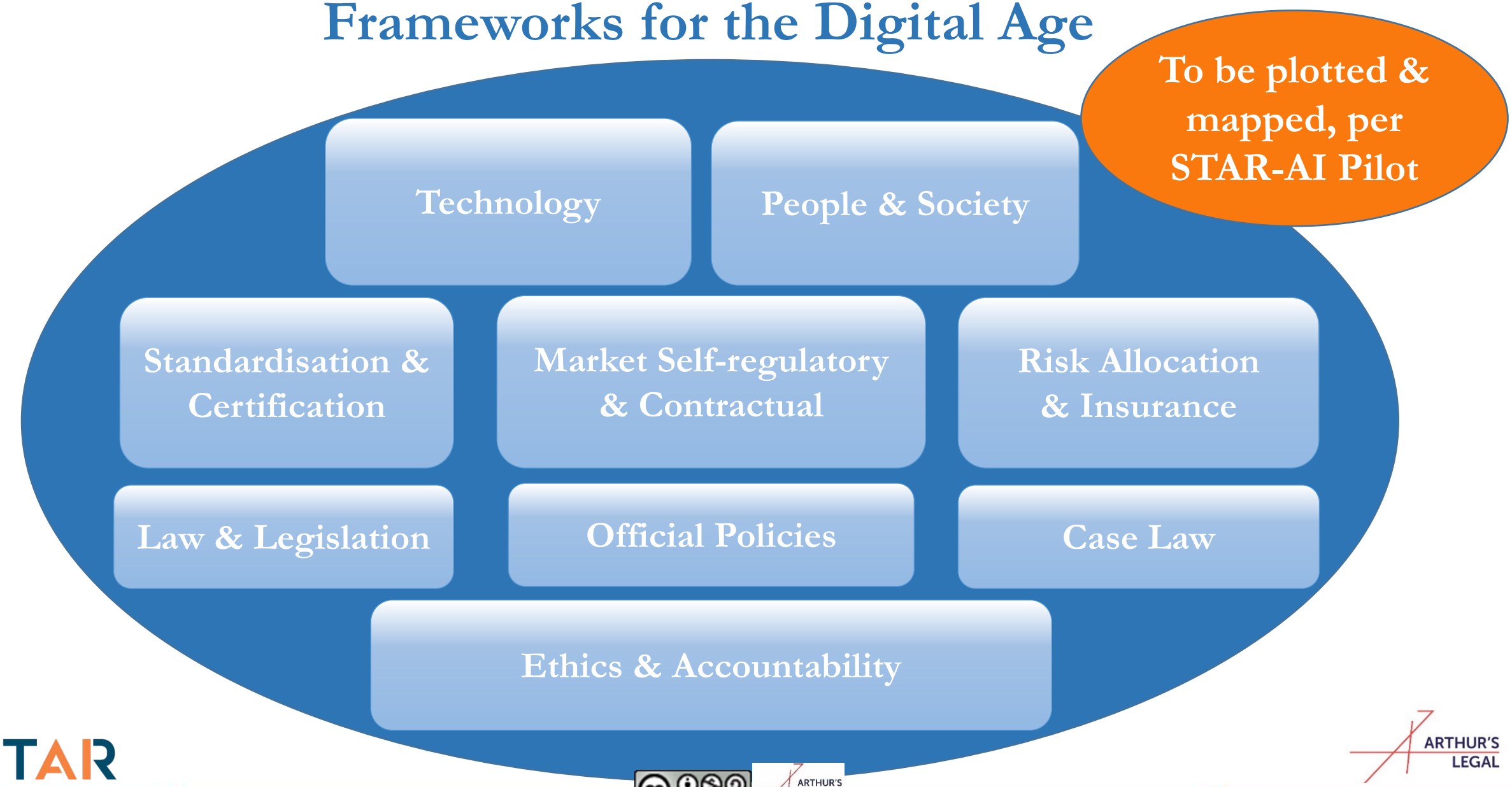
It does not work when non-functionals are not taken into account, Before, During and After.

Non-Functionals By Design By Default

Trust, Its Trust Components & Trustworthiness are Essentials, Solutions & Enablers, not Problems

Rule of Law Ecosystem for Transparant, Trust & Trustworthy Frameworks for the Digital Age



Spheres of Influence(rs)

1. **Yourself** (with Multiple Persona & Dynamic Roles and Responsibilities)
2. **Customers** Who Are Willing To Pay & Give Instructions (B2C, B2G, x2x)
3. **Users** (Convenience-Focused, Ambitious, Curious, Creative, Ignorant)
4. **Suppliers & Value Ecosystem** (Secure In, Secure Inside, Secure Out)
5. Thriving **Ecosystems & Society** (including the Non-User)
6. **Malicious Actors** (Collaborating with Each Other)
7. Act First Seek Forgiveness Later **Big Tech Titans & Others**
8. **Policy** Makers, **Standardisation** Development Orgs & Markets
9. **Authorities** (Who is responsible for what, and are they capable?)
10. **Governmental Access** (Law Enforcement & National Security)

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Stop Pointing To The Other One

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Risk is Multi-Stakeholder & Multi-Dimensional.

Opportunity & the Future is as well.

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Cyber-Physical Ecosystem Security Risk Spectra

Multi-Stakeholder & Multi-Layered

1. OT/IT/IoT (Connectors)
2. Functionality
3. Data & Flow
4. Application
5. Stakeholders
6. Intended Use
7. Sector
8. Expected Use
9. Software & OS Complexity
10. Implementation
11. Life Cycle
12. API/Interface
13. AI Capabilities
14. Actual Use
15. Function Creep

Arthur's Legal B.V.

Life Cycles

Extreme Short Term, Short Term, Mid Term, Long Term, Extreme Long Term

System Life Cycle	AI, Algo & Data Life Cycles	Stakeholders Life Cycle	Legal Life Cycle	Contextual Life Cycle

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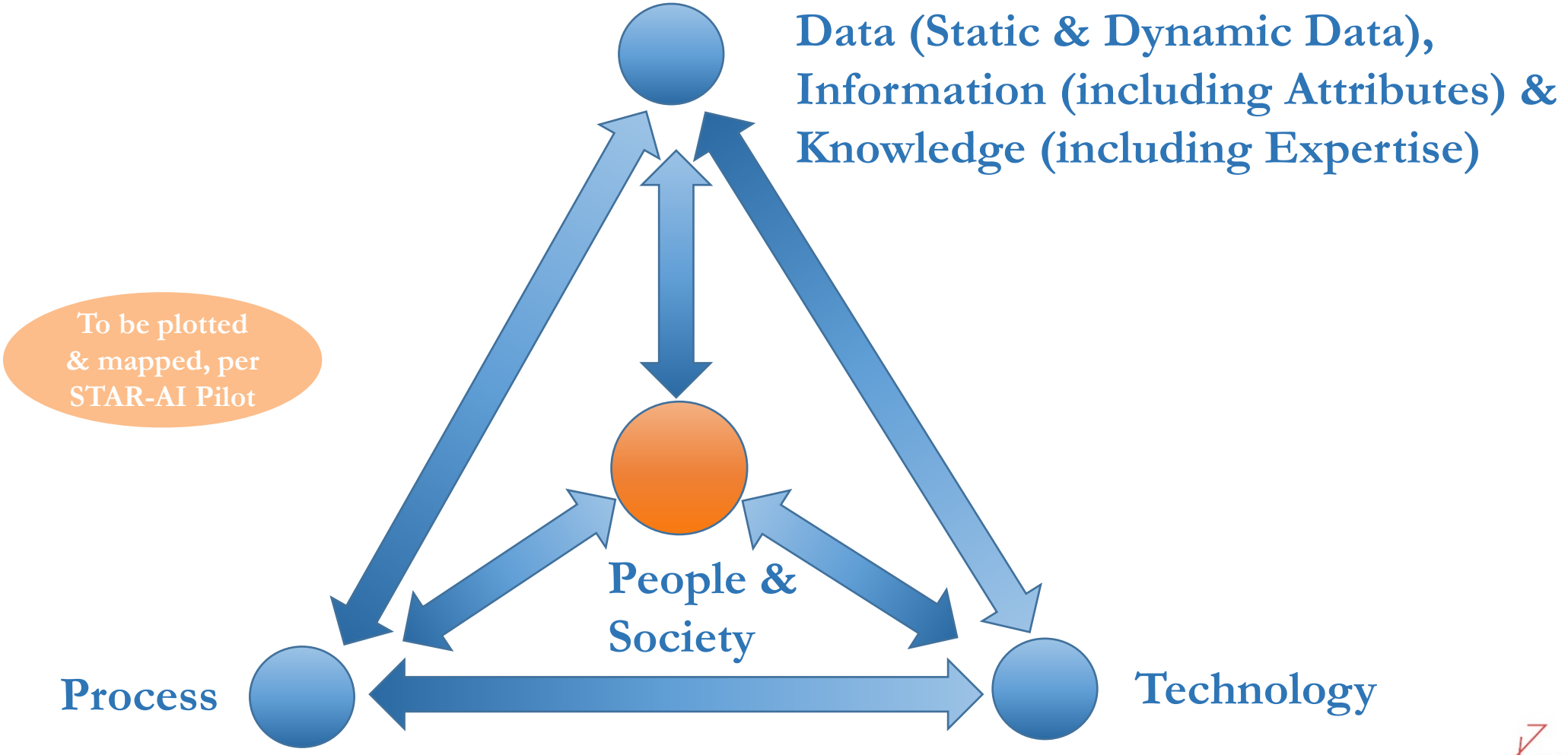
People, Process, Technology & Data

Human-Centric Organisations & Systems



7 Phases of the (Personal) Data Life Cycle

Which phase(s) are we talking about?
PII* or other Data + Actor + Legal Basis + Purpose(s)

1. Obtain /Collect
2. Create / Derive
3. Use
4. Store
5. Share / Disclose
6. Archive
7. Destroy / Delete

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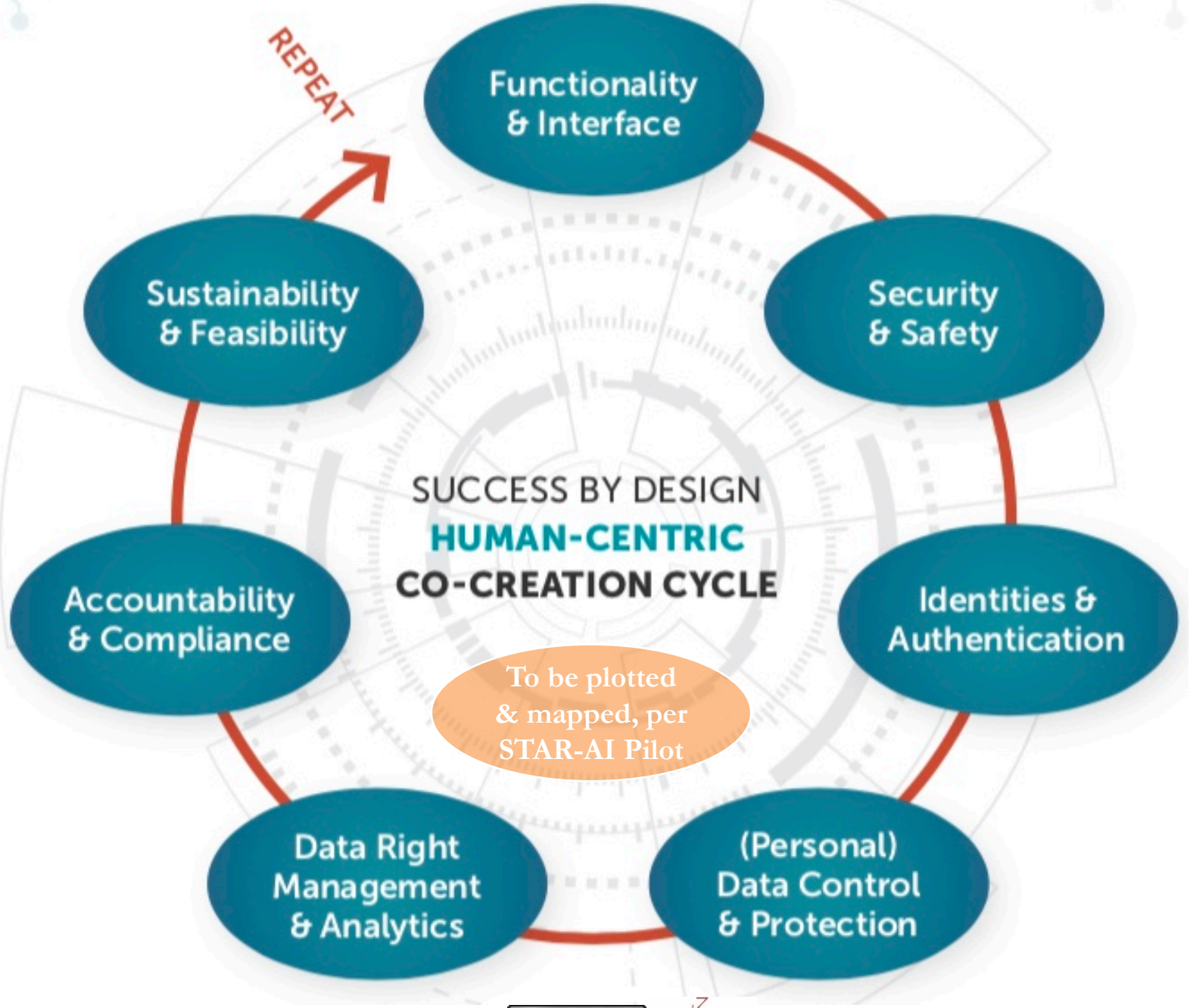
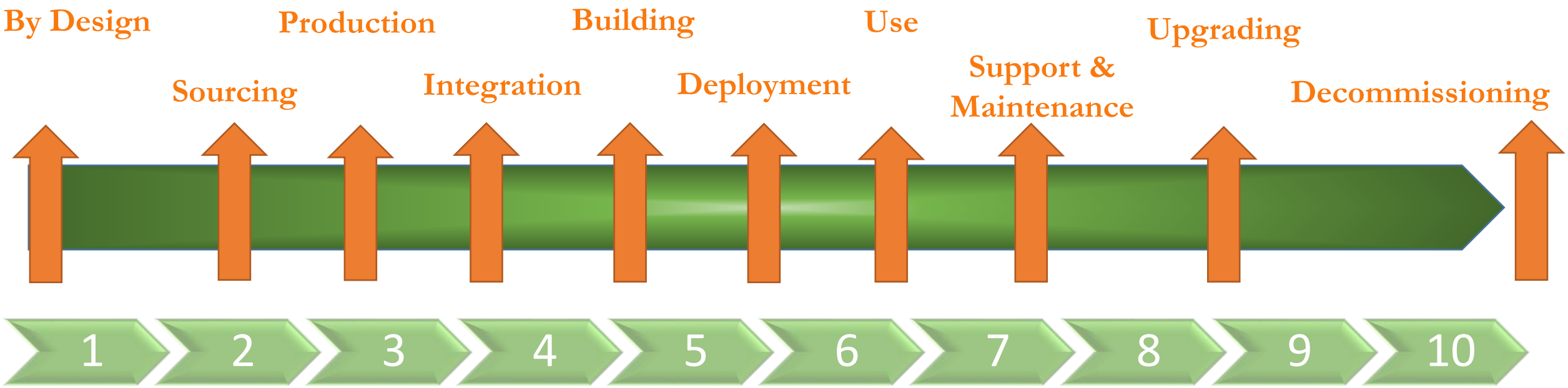
* PII: personal identified or identifiable information

Multi-Disciplinary



Inter-Disciplinary

Life Cycles of Relevance: When?



Short, Mid, Long & Extreme Long Term

To be plotted & mapped, per STAR-AI Pilot

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WORLD ECONOMIC FORUM

Top 10 skills of 2025

Source: Future of Jobs Report 2020, World Economic Forum.

A. Technical Measures

B. Organisational Measures

C. Policies & Documentation

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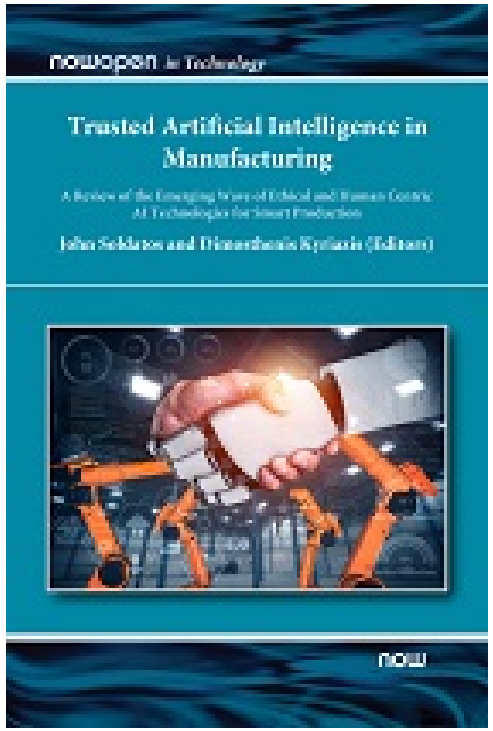


#Ethics: Chapter 11. With any emerging technology, or combination of existing technologies, one tends to focus on the technology itself. However, the technology should not be the focal point as it in itself is not the solution.

This also goes for Artificial Intelligence and the promising functionalities and capabilities it can or otherwise promises to bring, enable, facilitate and augment. For instance in the vast supply chains, manufacturing, logistics, maintenance and related Industry 5.0 domains.

The strategy, ethics, risk and success chapter of the will present notions and guidance to make AI work; not just function but also to have it prepared by design with embedded non-functionals for when things may go wrong and other risks it may encounter or cause.

All this for AI to help making 'it' work. This tiered approach provides value propositions that effectively address societal challenges, for which relevant AI functionalities in symbiosis with risk-based non-functionalities can be designed, deployed and continuously improved. In the Industry 5.0 domain this approach is aimed to result into valuable and feasible, human-centric, secure, safe, sustainable and otherwise trusted and trustworthy AI-supported intelligent ecosystems.

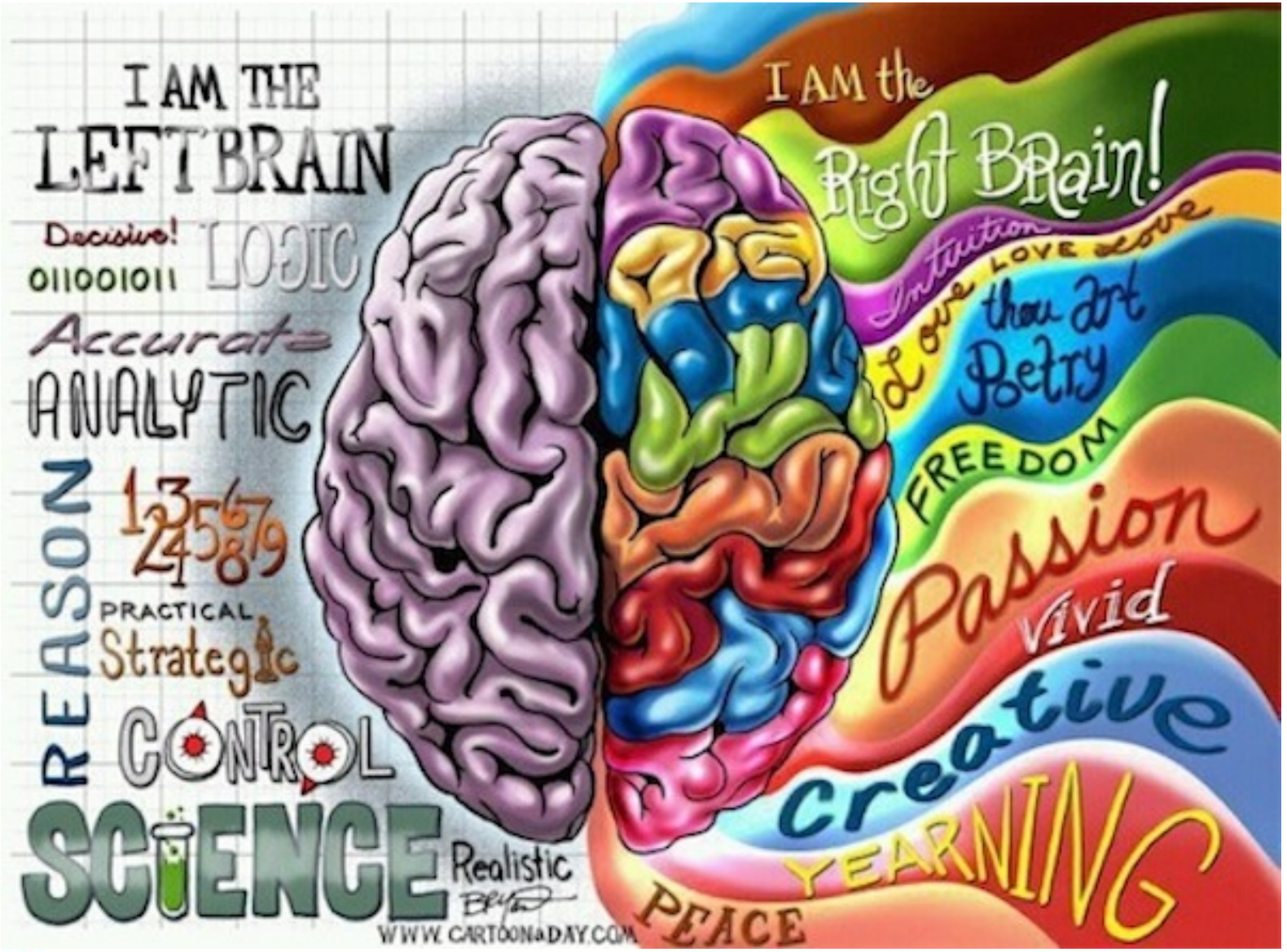
With that, the symbiotic, dynamic equation of both functionals and non-functionals is one of the main success factors for future-proof Industry 5.0 and related value creation.

Safe & Trusted Human-centric AI: To make it work, combining and balancing out both functionals and non-functionals is an essential success factor

Multiplicity:

Symbiotic combination of diverse groups of people working together with diverse groups of machines, data sets and algorithms to identify, address, solve problems, make decisions and – where under meaningful and accountable control – executes and monitors those decisions

Safe & Trusted Human-centric AI: To make it work, combining and balancing out both functionals and non-functionals is an essential success factor



Thank You!

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