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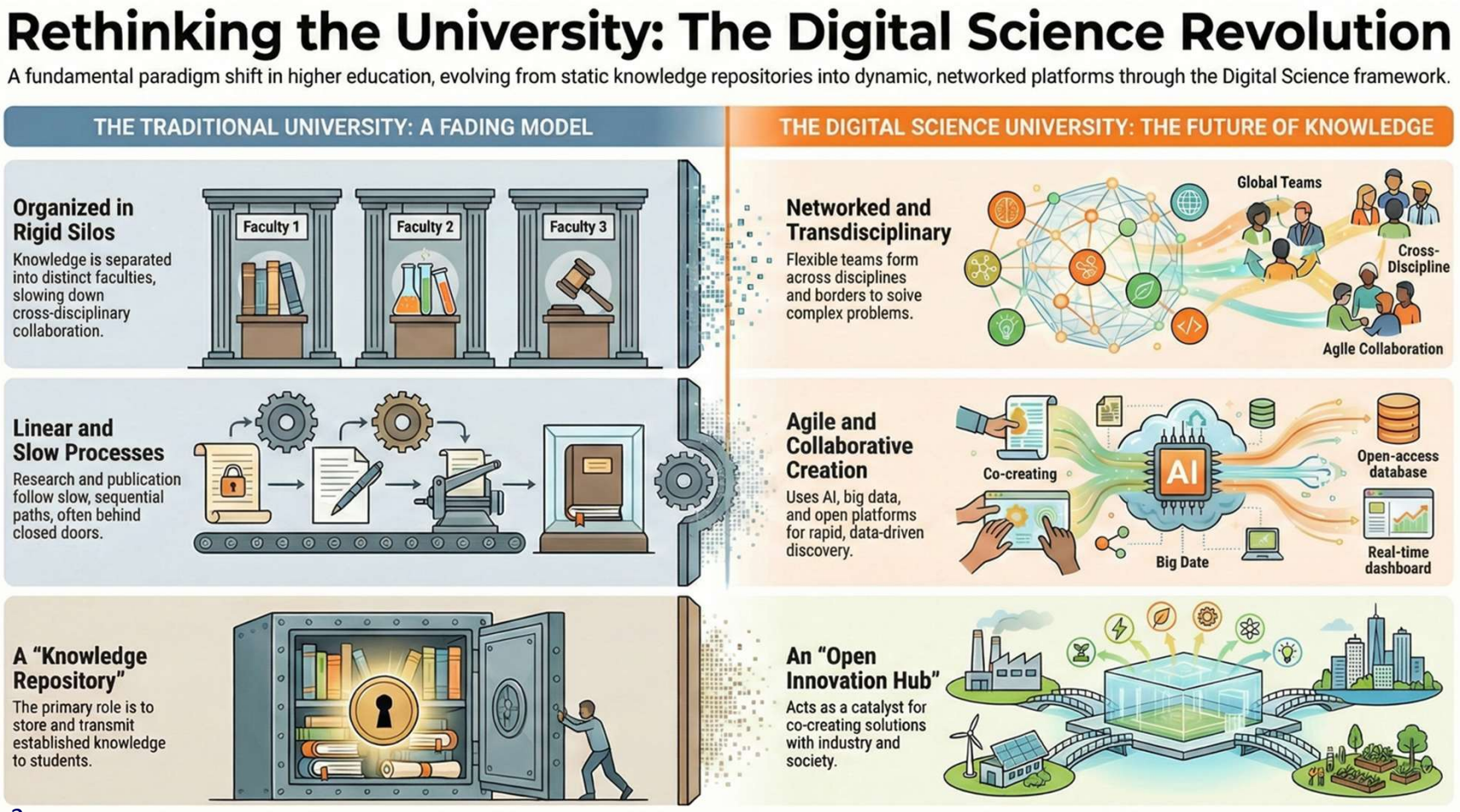
Rethinking the University: How Digital Science is Forging the Future of Research; Teaching, and Innovation

Prof. Dr. Mike Friedrichsen
President of the German University of Digital Science

Overview



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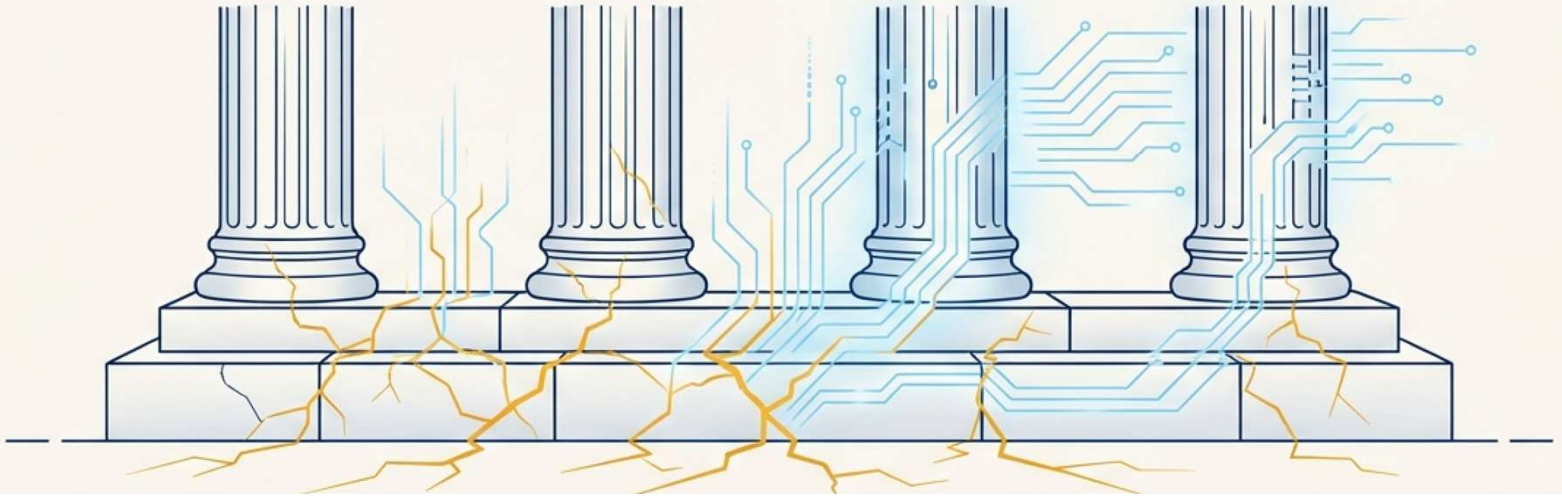
Rethink University

The university's foundations are being shaken by unprecedented digital dynamism and global crises.

The once-stable order of disciplinary science, guided by established methods and institutional structures, is facing radical disruption. Global challenges like climate change and health crises are forcing universities to fundamentally rethink their societal role and daily practices. (Source: p. 2)



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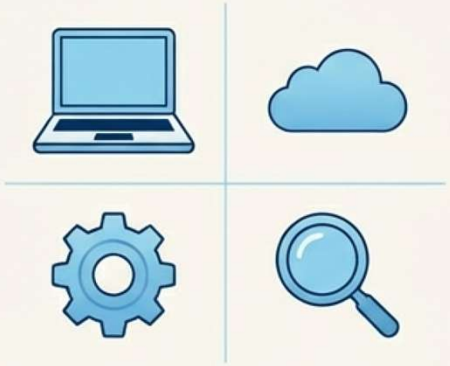
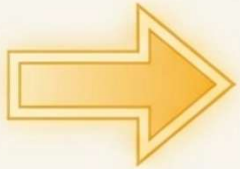
Paradigm Shift

Technology is not merely a new tool; it is a fundamental paradigm shift in how knowledge is created.

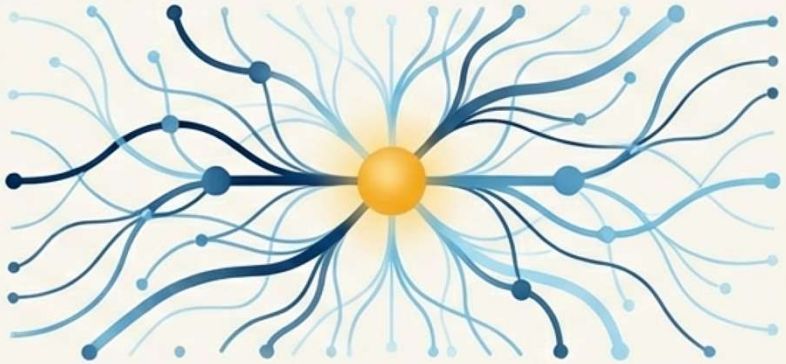
The necessary response is not simply integrating more technology. We are witnessing a shift from the university as a "knowledge repository" to an open, networked platform for cooperative knowledge production. This transformation requires a new intellectual framework to guide it. (Source: p. 2, 3)

Tools





Paradigm Shift



This new paradigm is called **Digital Science.**

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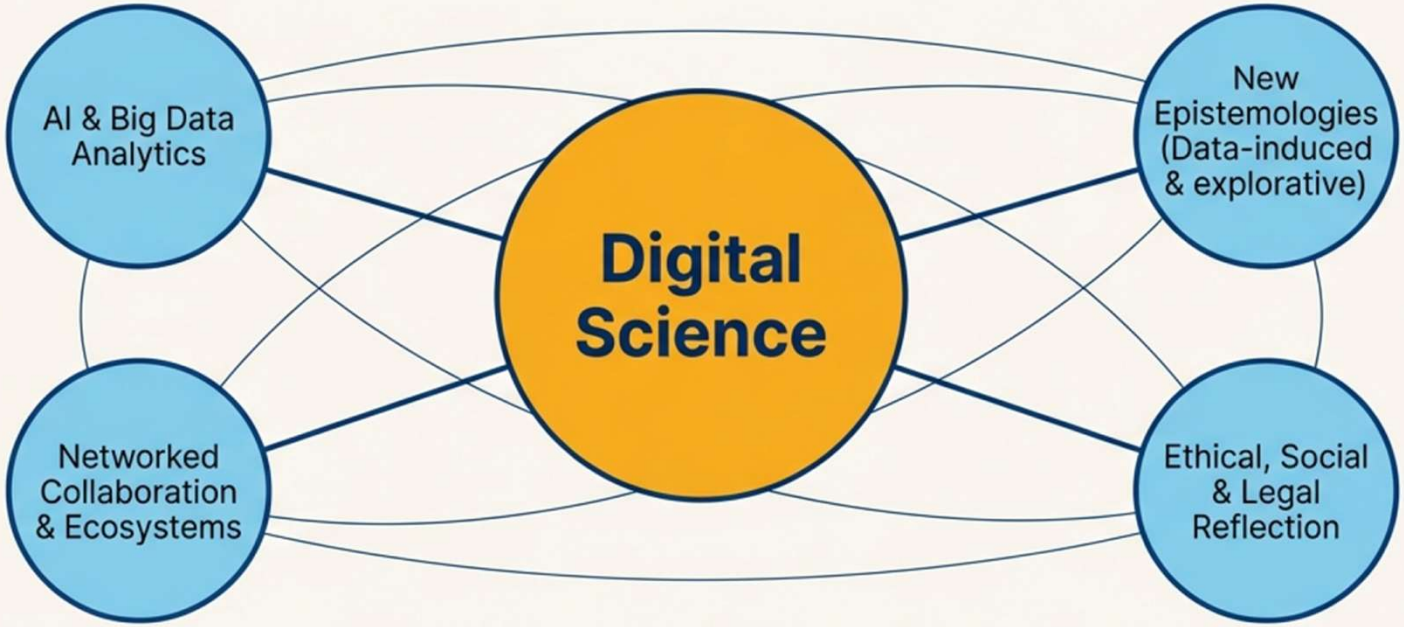
Definition Digital Science

Digital Science is an independent scientific discipline that shapes research and teaching for the digital age.



Digital Science analyzes, develops, and designs academic practices under the conditions of digital transformation. It moves beyond the instrumental use of tools to treat digital technologies as an integral, transformative dimension of scientific thought and action. (Source: p. 5)

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Core Dimensions

The paradigm shift driven by Digital Science unfolds across three core dimensions.

1. New Epistemic Methods

Knowledge generation is increasingly algorithmic, explorative, and based on complex simulations. Machine learning and big data analytics augment traditional empirical and theoretical approaches. (Source: p. 4)

2. New Scientific Ecosystems

Rigid, sequential review processes are giving way to open, participatory, and decentralized models like Open Peer Review, preprint servers, and collaborative data repositories. (Source: p. 4)

3. New Societal Responsibility

Research results are now transmitted, discussed, and applied in near real-time, demanding greater transparency, ethical reflection, and social embedding of scientific work, as seen in the global response to the COVID-19 pandemic. (Source: p. 4)

Transdisciplinary Collaboration

The logic of traditional faculties is a barrier to solving today's complex "Grand Challenges."

Historically institutionalized faculty boundaries are reaching their limits when faced with complex issues. Solving challenges like the COVID-19 pandemic or conducting large-scale projects like the Human Brain Project requires the seamless integration of knowledge from medicine, computer science, social sciences, and more. (Source: p. 7)

Digital Science provides the methods and structures for this essential transdisciplinary collaboration.

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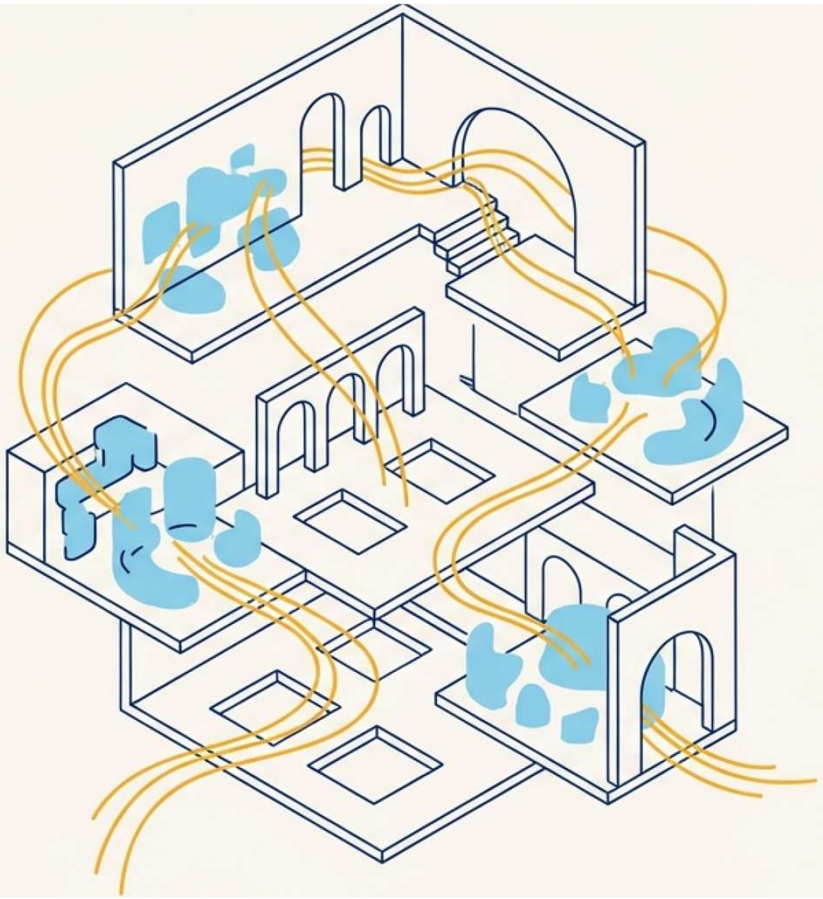
Integrated Digital Infrastructure

The university is evolving into a ‘Digital Agora’—a dynamic marketplace for knowledge, innovation, and discourse.

The university is transforming from a monolithic institution into an open space that transcends traditional boundaries of discipline, place, and function. Research, teaching, and societal exchange will be organized on an integrated digital infrastructure that flexibly connects all actors and processes. (Source: p. 6)



SWOT

The future of a university powered by Digital Science presents a clear strategic landscape of opportunities and risks.

Strengths Flexible, scalable collaboration networks; increased institutional resilience and adaptability through data-driven systems. (Source: p. 8)	**Weaknesses** New challenges in data security and privacy; risk of deepening the 'digital divide' without universal access to infrastructure and skills. (Source: p. 8)
Opportunities New forms of participation (Citizen Science); accelerated knowledge transfer between academia, industry, and society. (Source: p. 9)	**Threats** Over-technization and algorithmic intransparency; loss of genuine discourse spaces; systemic vulnerability to cyber threats. (Source: p. 9)

Institutional DNA

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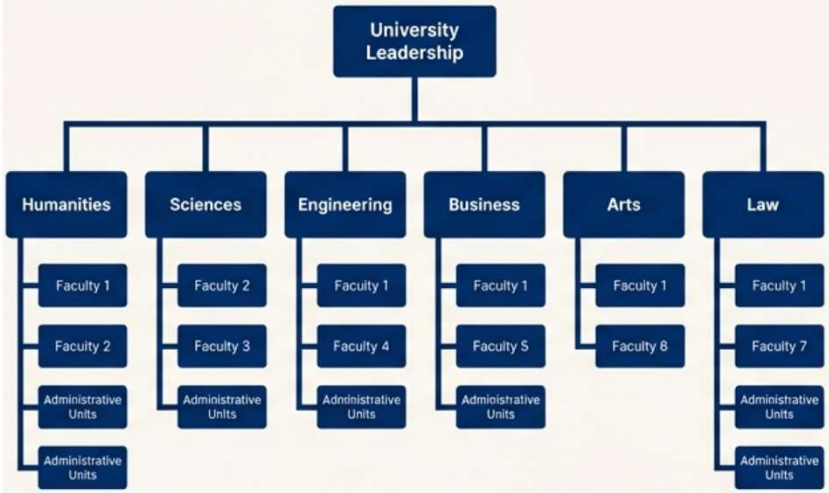
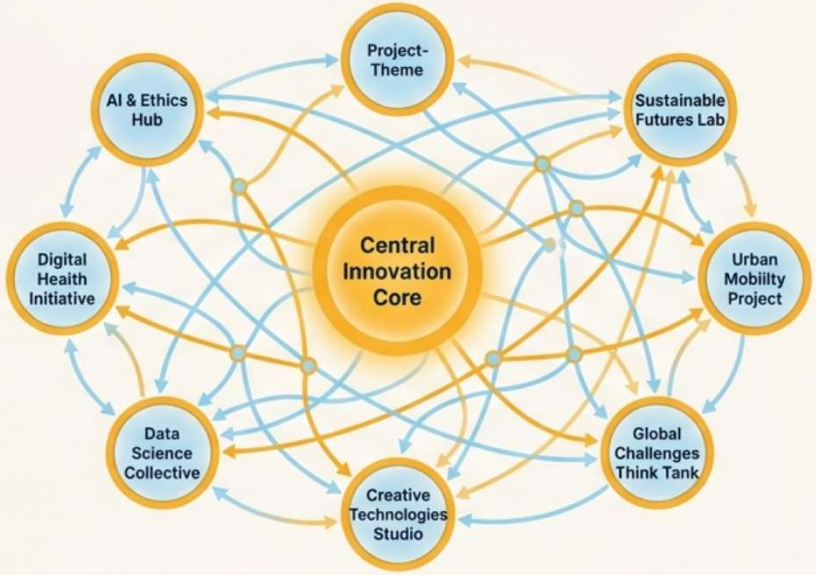
German UDS Model

The German UDS is designed for the future through a complete re-architecture of the university model

Traditional University



German UDS Model



Unlike established universities that add digital elements to traditional structures, the German UDS is built entirely on the principles of **modularity**, **API-based ecosystem logic**, and **transdisciplinary collaboration.** (Source: p. 10)

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Four Key Pillars

Four key pillars show how the German UDS operationalizes Digital Science.

1. Transdisciplinary Research Centers

Co-creative spaces where students, researchers, and external partners work together on projects, dramatically shortening innovation cycles.
(Source: p. 10)

2. Modular, Hybrid Master's Programs

Curricula designed for flexibility, individual specialization, and seamless international connectivity.
(Source: p. 10)

3. API-Based Research Networks

Enabling real-time, transdisciplinary cooperation that transcends faculty and national borders, massively accelerating knowledge transfer to industry and policy.
(Source: p. 10)

4. Open Innovation Projects

Co-creative projects with companies and institutions are embedded directly into the curriculum, strengthening practical skills, employability, and societal impact from day one.
(Source: p. 10)

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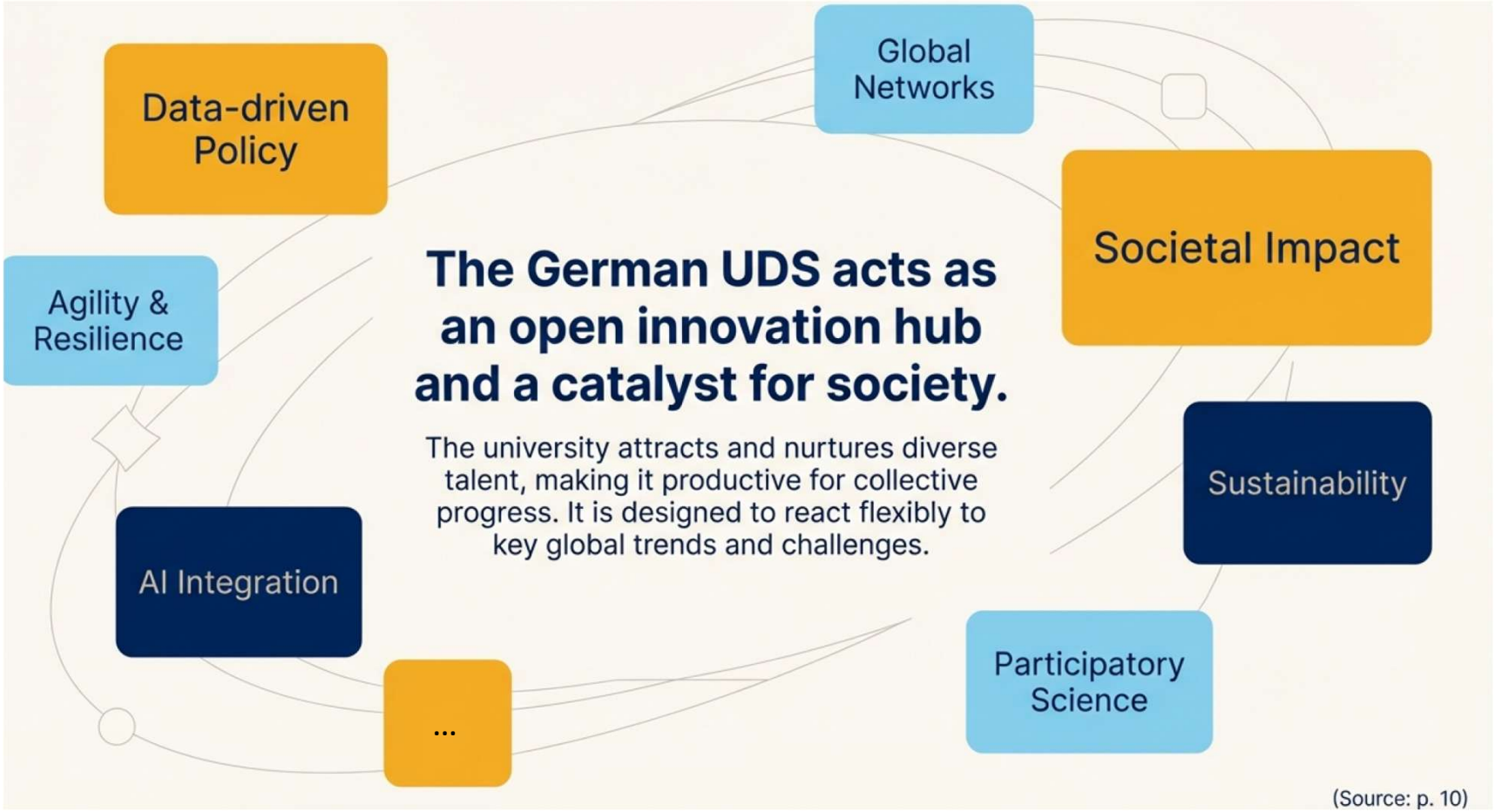
Open Innovation Hub



(Source: p. 10)

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New Standards

The German UDS's pioneering spirit sets a new, forward-looking benchmark for the university of tomorrow.

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Its institutional will to innovate offers more than just an answer to digital change; it sets a new standard for what a relevant, agile, and globally connected university can be, both regionally and internationally. (Source: p. 11)

New Standards

Appendix: Source & References

The concepts and analysis presented in this deck are based on the paper:

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