UNIVERSITÄT
ZU KÖLN

VALUE-DRIVEN AI
THE AI STRATEGY OF THE UNIVERSITY OF COLOGNE, 2026–2029

Harnessing the Potential of Artificial Intelligence in Higher Education, Research, Transfer, and Management and Administration

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IMPRINT

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This strategy is based on the work of the *Arena "Artificial Intelligence at the University of Cologne"* and the more than 600 members of the University of Cologne who contributed during the process.

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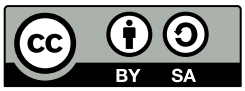

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EXECUTIVE SUMMARY

Artificial Intelligence (AI) is transforming all university missions and domains. For the University of Cologne, this creates both new opportunities and new responsibilities. This strategy, therefore, provides a shared institutional framework for the responsible, value-driven, and future-oriented adoption of AI across the university. It complements existing frameworks, especially the AI Policy, and aligns AI-related developments with the university's broader strategic goals.

The strategy embraces AI and is based on the idea that AI should and can strengthen, rather than compromise, e.g., academic quality, integrity, and responsibility. The strategy also explicitly addresses the role of the university in responsibly shaping AI futures. Hence, the strategy's purpose is not simply to accelerate AI adoption, but to ensure that AI is adopted and used holistically and in ways that are aligned with the university's values and its mission. To support this, the strategy addresses all missions and domains, applies a "Perspectives-on-AI" approach to widen the perspective, and defines a set of guiding normative principles for the UoC.

The implementation follows established governance and operation models. Responsibilities are shared between the CIO Board and the AI Office as established in the UoC's AI Policy. A central implementation mechanism is the Dual-Track Approach, which combines a path to swift direct adoption of AI-related actions with controlled experimentation and evaluation. This allows the university to promote innovation while maintaining oversight, risk awareness, and institutional learning.

For 2026–27, the university will focus on seven priorities: establishing the AI Office, attracting additional talent and expertise, providing centralized information, launching the Dual-Track Approach, extending the AI infrastructure, rolling out additional foundational learning offers, and supporting a first portfolio of lighthouse use cases and best practices. Together, these steps create the foundations for scalable and responsible AI adoption across the university.

Because AI is evolving rapidly, the strategy should be understood as a living framework that will require continuous review, learning, and further development.

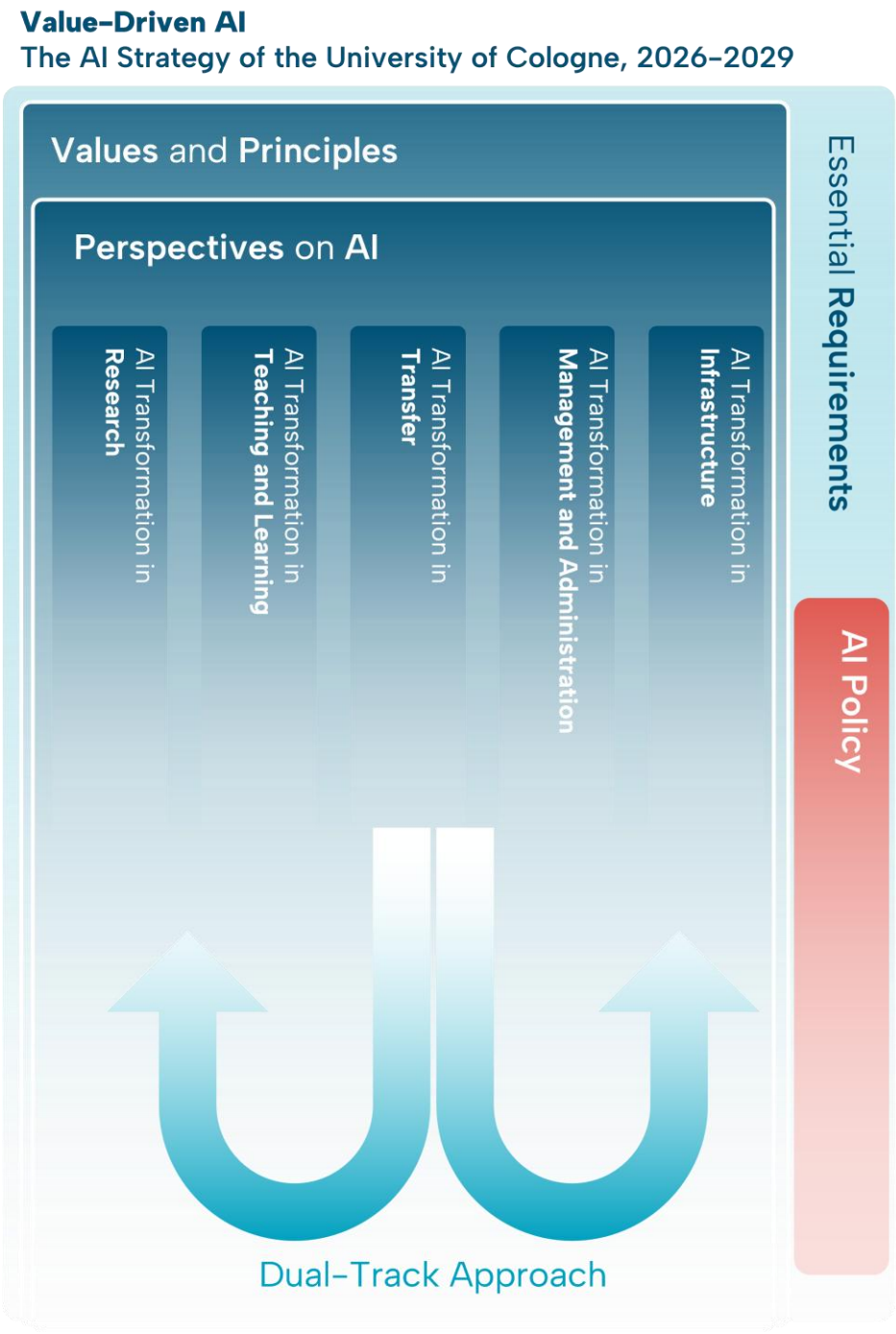

Figure 1 – Overview of the AI Strategy

1. INTRODUCTION

The release of ChatGPT in late 2022 marked a turning point for Artificial Intelligence (AI), transforming it from a specialized field into a mainstream phenomenon that captured global attention and has already fundamentally transformed many sectors – including higher education. Regardless of how overblown some of the claims made during this phase of AI hype are, the technology has demonstrated its potential to reshape how we work, learn, and create. As we stand at this inflection point, we seem to face both unprecedented yet unclear opportunities and serious risks that demand careful consideration and proactive governance.

Research and education stand at the forefront of this transformation. Researchers are able to leverage AI in ways not seen before, and we are seeing an acceleration of research, but also pressing questions regarding, e.g., quality, academic freedom, good scientific practice, and academic integrity. At the same time, AI research, especially public AI research, is foundational for research itself and for the responsible adoption of the technology.

Similarly, both learners and educators are faced with new and exciting opportunities for teaching and learning, whilst having to answer questions about new and old competencies, the roles of learners and teachers, and the purpose and integrity of established forms of assessment. Of course, AI also has a fundamental impact on all other missions and domains[1] of the university, ranging from developing (sovereign) infrastructure to bringing AI research into society.

THE AI STRATEGY AND THE AI POLICY

The University of Cologne consciously differentiates between this overarching and comprehensive AI strategy and its AI Policy ("Richtlinie zum Einsatz von Künstlicher Intelligenz (KI) an der Universität zu Köln") which has been ratified in 2026.

While this strategy outlines and proposes fundamental values, principles, perspectives, objectives etc., the AI Policy provides clear and binding legal guidelines for the adoption and use of AI across the university. Therefore, the two documents – the AI Strategy and the AI Policy – should be regarded as supporting each other, each providing a different perspective.

While the development and adoption of AI are accelerating, organizations and the actors within them require guidance on how to navigate this transformation without creating unnecessary barriers to innovation or introducing additional uncertainty.

Hence, this document presents the University of Cologne's (UoC) comprehensive and holistic AI strategy for 2026–2029, designed to position the university as a leader in responsible AI adoption and

[1] This strategy employs the terminology of "missions and domains" to clearly mark that the strategy is going beyond the established core missions of research, teaching, and transfer.

integration across research, teaching, transfer, management and administration, as well as infrastructure.

The UoC strongly believes that AI is already and will become even more indispensable in the future and that it is essential for remaining competitive in academia and beyond. As one of Germany's largest and most research-intensive universities, the UoC has to take responsibility for and lead this fundamental transformation. Therefore, this strategy focuses on the UoC's specific role as a public research university driven by values and on its responsibility in and for society.

1.1 A COMPREHENSIVE APPROACH ACROSS ALL MISSIONS AND DOMAINS OF ACTIVITY

Rather than pursuing AI adoption for its own sake, this strategy systematically builds on our existing strengths, particularly our robust and growing AI research and infrastructure capabilities, while addressing critical gaps, e.g., with regard to competencies and AI literacy as well as governance.

Our approach balances ambition with prudence: moving quickly enough to capture AI's transformative potential while maintaining the academic rigor and ethical standards that define our institution and correspond to our role as a major public actor. Doing so, the approach recognizes the need for rapid and experimental action as, to quote Lewis Carroll (2024 [1871]: 21), "it takes all the running you can do, to keep in the same place."

In contrast to many other AI strategies, the UoC is approaching AI from a comprehensive perspective, bringing together its missions and domains of activity. While this necessarily leads to a broader approach, it allows us to consider many critical building blocks of AI readiness – competencies and AI literacy, infrastructure, culture, compliance, etc. – as overarching challenges. It also aligns with our conviction that AI adoption is a cross-cutting organizational transformation process that goes beyond individual missions and domains and requires expertise and intense collaboration across them.

THE STRATEGY PROCESS

This strategy is the outcome of a university-wide process initiated by the Rectorate and led by Beatrix Busse. It was developed in response to the growing impact of AI on academic life and the need for shared institutional orientation. Hence, this strategy was developed in a co-creative strategy process that began in November 2024 with the arena "Artificial Intelligence at the UoC". The arena process (cf. Busse 2022) comprised a kick-off webinar, three participative arena workshops, and a concluding resonance webinar. Furthermore, a university-wide survey (579 replies), primarily targeting UoC staff, served as a key source of information and the foundation for the SWOT analysis. More than 600 people, including students, educators, researchers, administrative staff, and experts, participated. The document was drafted by a smaller writing team and reviewed by the arena members.

This strategy provides a framework for enhancing our institutional readiness, empowering our community, and integrating powerful tools in ways that amplify rather than replace human expertise and judgment. Doing so, the strategy is meant as a framework and harness for all of UoC's AI activities and sees itself as a foundational building block for strategic, tactical, and operational activities.

1.2 NAVIGATING UNCERTAINTY TOGETHER

Rather than producing a rigid policy or technology roadmap, the aim of this strategy is to provide a shared framework for dialogue, experimentation, implementation, and collective learning.

Therefore, this strategy provides:

- a guiding framework for AI adoption and usage, proposing a set of shared principles and values.
- an approach to analytically considering AI from a variety of interrelated perspectives.
- a critical discussion of essential requirements and a pathway to AI readiness and adoption.
- an approach to managing responsibilities and quality management, as well as a dual-track approach encouraging both experimentation and direct adoption.

Taken together, these will serve as the strategic framework for the UoC, providing clear guidance while staying open for experimentation and, e.g., domain-specific requirements and approaches.

Rather than predicting outcomes, we begin by enabling inquiry. This enables us to navigate uncertainty together — grounded in our enduring commitment to rigorous inquiry, critical reflection, and public responsibility.

Furthermore, we acknowledge that AI is developing at a rapid pace and that the half-life of any meaningful AI strategy is severely limited. A comprehensive, overarching AI strategy, while less focused on the details of individual missions and domains, has the potential to remain relevant for longer and, hopefully, achieve its projected four-year lifespan.

1.3 OVERARCHING OBJECTIVES

At the heart of the strategy are deeply interlinked strategic objectives that guide our AI efforts. At their core, these objectives aim to increase AI readiness and drive value-driven AI adoption across all UoC missions and domains.

Furthermore, they aim to enable the UoC to shape AI development and, at least, to continuously adapt and respond coherently and responsibly to rapid and uncertain technological change.

1.3.1. CREATING ALIGNMENT AND INSTITUTIONAL READINESS

Establishing the strategies, structures, technological capabilities, and institutional resources required for the responsible integration of AI across all university missions and domains. This includes aligning AI efforts with, e.g., the university's digitization and research strategies, without duplicating them.

To measure progress, we will assess the degree of formal alignment among strategies and the number of missions and domains with articulated, domain-specific AI strategies and action plans as well as their maturity.

1.3.2. FACILITATING CULTURAL CHANGE

Encouraging a critical yet open-minded attitude towards AI. This means moving beyond fear or blind enthusiasm and fostering an environment where AI integration is met with understanding, inquiry, and responsible experimentation. Responsible risk-taking is expected and supported, not penalized.

To measure progress, we will assess (e.g., via surveys) AI attitudes, the quantity and quality of AI use cases, best practices, and "positive failures," as well as participation rates in AI-related events.

1.3.3. STRENGTHENING AI COMPETENCIES

Ensuring that everyone at UoC, from students to staff, is equipped with the knowledge, skills, and attitudes to engage with AI. This includes both broad AI literacy and domain-specific expertise, allowing for innovation, institutional sovereignty, and long-term adaptability.

To measure progress, we will assess the adoption of our baseline AI competency framework, the share of UoC members who complete AI training, and the development and uptake of AI-related educational offerings in- and outside of curricula.

1.3.4. PROVIDING AI INFRASTRUCTURE

Ensuring access to secure, reliable, sovereign, and competitive AI infrastructure, supporting not just research but the adoption and application of AI across the UoC and its partners.

To measure progress, we will assess the funding for AI infrastructure, the availability and adoption of centrally provided AI services (especially our inference service), the number and coverage of allowlisted (and used) AI applications across missions and domains, and the share of UoC members with access to AI applications, as well as their satisfaction levels with the infrastructure.

1.3.5. ENSURING AI GOVERNANCE AND CLEAR RESPONSIBILITIES

Developing governance structures that ensure accountability, transparency, and legal and ethical compliance. These structures guide AI-related initiatives while upholding academic freedom, human-centered values, and institutional integrity.

To measure progress, we will assess the operational maturity of the AI governance and responsibilities, the level of engagement and

quality (e.g., support cases, satisfaction) of the AI Office, the development and up-to-dateness of governance-related documents and instruments, and the effectiveness of the dual-track approach (e.g., successful cases per track).

1.3.6. ENABLING PRACTICAL AND VALUE-DRIVEN AI ADOPTION

Actively driving the uptake and scaling of AI across all university missions and domains — not for its own sake, but grounded in the university's core values and guided by the principles outlined in this strategy. This includes lowering barriers to entry, providing hands-on support and the means for practical AI adoption, and creating clear pathways through the dual-track approach for both proven and experimental applications.

To measure progress, we will assess the number and quality of successful AI projects across missions and domains, the reach and uptake of the AI Office and its services, the intensity of support (e.g., funding, hands-on support) projects receive, and the alignment of projects with the strategy's values and principles.

All of these overarching objectives are underpinned by the university's identity as a research-intensive public institution committed to shaping, not simply adapting to, technological change. UoC's approach to AI is grounded in its broader societal mission. We aim to leverage AI not only to improve the quality of our research, teaching, and administration, but also to advance our values as a public university.

2. THE UNIVERSITY OF COLOGNE IN THE AI LANDSCAPE

In the current AI landscape, every institution is working on an AI strategy. In order to ensure institutional, strategic, and regulatory alignment, this chapter outlines some core assumptions as well as fundamental considerations with regard to alignment.

2.1 WHAT DO WE MEAN BY "ARTIFICIAL INTELLIGENCE"

There is no single, stable definition of Artificial Intelligence. From its earliest formulation, the concept has been contested and evolving – as has its origin. While the 1956 Dartmouth Workshop is often cited as AI's point of origin, we want to credit the long history of thought before that and, in particular, Ada Lovelace's work on the Analytical Engine in 1842-1843.

In 1955, John McCarthy — one of the field's founding figures — described AI as *"the science and engineering of making intelligent machines"* (McCarthy et al. 2006). While that definition captured the ambition of the time, the meaning of "intelligence" and the capabilities of machines have since shifted significantly.

Today, public and academic discourse often associates "AI" with machine learning, and more recently, with generative systems such as Large Language Models (LLMs) that can produce human-like text, images, code, etc., as well as agentic AI systems. These systems raise new questions about epistemology, authorship, understanding, autonomy, and responsibility.

In this document, we use the term AI pragmatically to refer to any digital system that performs cognitive tasks, presents as autonomous or "intelligent", and is used to support or substitute human cognitive activities.

The approach largely corresponds to the terminology used in the EU AI Act, including the working definition of an "AI system" (see Article 3) as:

> "a machine-based system that is designed to operate with varying levels of autonomy and that may exhibit adaptiveness after deployment, and that, for explicit or implicit objectives, infers, from the input it receives, how to generate outputs such as predictions, content, recommendations, or decisions that can influence physical or virtual environments."

In addition, both this strategy and the AI Policy share a common understanding of the term "AI-Application," which we use as a cover term for both AI systems and AI models.

We do not attempt to settle the philosophical or disciplinary debates about "intelligence". On the contrary, we recognize that such critical debates are part of the university's role. The goal of this framework is not to define AI narrowly or normatively, but to provide a shared

orientation. Therefore, we want to explicitly go beyond generative AI and encompass everything from traditional machine learning to bleeding-edge autonomous, agentic systems.

2.2 INSTITUTIONAL CONTEXT AND AI READINESS

To better understand the current use of AI at the UoC as well as the institutional readiness, we undertook a comprehensive SWOT analysis during the strategy process based on a university-wide survey, expert consultations, and arena workshops.

A vibrant ecosystem of AI initiatives has already emerged across all UoC's core missions — typically through decentralized, bottom-up experimentation. In a 2025 study, roughly half of the staff reported using AI applications, even in the absence of shared infrastructure or guidelines. Faculties, departments, and support units have launched initiatives ranging from curriculum innovations and research applications to exploratory uses of generative AI in their daily workflows. Furthermore, across all faculties, AI has firmly entered research, both through conducting AI research and through using AI within research.

These efforts demonstrate strong engagement and potential for scale and serve as stepping stones for broader institutional transformation. This growing engagement is underpinned by significant internal strengths. The university hosts strong academic expertise in AI, is a leading institution in Germany with regard to building and providing sovereign AI infrastructure based on powerful compute/HPC infrastructure, and is already integrating AI-related content into teaching and learning. The UoC is also embedded in national and regional networks and projects, e.g., the recently funded KI:Expertisezentrum.nrw, that support knowledge exchange, innovation, collaborative action, and pathways into shaping policy.

Despite these strengths, some foundational requirements remain incomplete. The digital transformation, especially with regard to standardized and digitized processes, particularly in administrative contexts, is still underdeveloped. While access to some AI tools is given and the UoC is rapidly expanding its compute capabilities, especially commercial tools and models are not yet widely available. Many AI-related initiatives remain siloed, with limited transversal coordination or visibility, and there is not yet a central platform for accessing information about AI-related activities, expertise, or support. Within research, as well as teaching and learning, AI adoption is rising, but in a decentralized and non-coordinated fashion. Competence levels, especially focusing on staff, vary widely across the UoC, and while some steps, e.g., defining baseline competencies and creating an online AI crash course, have been taken, systematic training opportunities are still lacking.

These weaknesses hinder the UoC's ability to scale successful practices and ensure equitable participation in the AI transformation. This strategy responds to that situation by providing a shared framework for university-wide coordination and action that is aligned with the university's values.

2.3 STRATEGIC AND REGULATORY ALIGNMENT – INSTITUTIONAL, NATIONAL, AND EUROPEAN

The UoC's AI strategy is designed to align with key internal and external frameworks while contributing to their ongoing development. Doing so, the strategy aims to ensure alignment and interoperability as well as opportunities for synergetic cooperation.

2.3.1. INSTITUTIONAL ALIGNMENT

The strategy is designed to complement, not replace, existing strategies and frameworks, including the university's AI Policy, the Research Strategy, the Transfer Strategy, the Digitization Strategy, and the Platform Concept. The strategy also ties into existing governance structures.

2.3.2. STATE-WIDE ALIGNMENT

The strategy is aware of the state-wide (NRW) AI initiatives, including, e.g., the Digital Hochschule NRW, KI.NRW as well as individual projects such as the KI:Expertisezentrum.nrw. Doing so, the UoC wants to leverage existing networks, create opportunities, and strengthen its position within the state's AI ecosystem.

2.3.3. NATIONAL, EUROPEAN, AND INTERNATIONAL ALIGNMENT

The strategy also supports the UoC's positioning within the broader national, European, and international AI landscape. For example, it reflects and builds upon existing frameworks and regulations such as the European AI Strategy, the European AI Act, and relevant initiatives under Horizon Europe.

3. A VALUE-DRIVEN APPROACH TO AI

This strategy outlines the role of AI at the UoC, clarifying what AI can and cannot achieve across the university's missions and domains. Especially as a public university, we strive for a forward-looking and innovative but equally responsible and value-driven approach to AI adoption. By highlighting the value-drivenness of this strategy, the UoC wants to put emphasis on the specific role of universities, e.g., as compared to industry, in shaping possible AI-defined futures.

VALUES AND PRINCIPLES

The establishment and use of values and principles are standard practices at the UoC as can be seen, e.g., in Q³UoC.

Values are core beliefs that guide our behavior and define what's important to us. Principles specify and operationalize these values and make them actionable.

Therefore, especially to provide a framework for responsible decision-making, this strategy outlines key values and principles guiding our AI adoption and usage efforts. This approach also mirrors, e.g., the European Commission's recommendations for research organizations, stating that these organizations should "promote, guide and support the responsible use of generative AI in research activities" (European Commission 2025: 9).

3.1 VALUES

The UoC's Strategic Development Plan 2023-2028 outlines the university's mission – creating and transferring knowledge, educating global citizens, advancing scientific methods, and driving innovation to meet challenges and opportunities – as well as five core values: excellence, integrity, academic freedom, respect, and responsibility.

These core values are crucial for the responsible integration of AI across all missions and domains and serve as a critical backdrop for all of our decisions. They bind us to ensuring that AI enhances quality while upholding high ethical and scientific standards, protecting autonomy, promoting inclusivity, and addressing both opportunities and risks associated with AI.

3.2 PRINCIPLES

To operationalize the UoC's values within the field of AI, we have defined a series of principles that guide our decision-making and actions when it comes to AI.

3.2.1. ENSURE KNOWLEDGE INTEGRITY AND GOOD SCIENTIFIC PRACTICE

AI must uphold or strengthen transparency, reproducibility, and good scientific practice, safeguarding the trustworthiness and integrity of academic knowledge. This includes reflecting on epistemological questions and taking responsibility for any scientific output.

3.2.2. ENSURE HIGH-QUALITY EDUCATION AND LEARNER DEVELOPMENT

AI must enhance learning, reflection, critical thinking, and creativity, supporting active learning, independence, and intellectual depth rather than just optimizing teaching and learning for efficiency. This includes promoting evidence-based ways of using AI within teaching and learning that support learning.

3.2.3. ENSURE OPENNESS AND TRANSPARENCY

AI should, where possible, be open (e.g., open source, open data) and transparent. If proprietary systems are developed or used, the reasons for this decision must be clearly communicated. This includes promoting the development and use of open AI models and AI applications, as well as providing data, research, etc. openly (e.g., open science, open education).

3.2.4. ENSURE INSTITUTIONAL AUTONOMY, SOVEREIGNTY, AND ACADEMIC FREEDOM

AI governance must guard against external dependencies and control as best as possible, favoring open, standardized, interoperable, and modular systems that preserve the university's control and freedom. This includes carefully assessing requirements and risks, e.g., related to vendor lock-ins and proprietary software.

3.2.5. ENSURE SECURITY, PRIVACY, AND DATA PROTECTION

AI use must meet legal standards and needs to be designed, deployed, and used in ways that proactively prevent security, privacy, and data protection risks. This includes informing and training users on best practices.

3.2.6. ENSURE DIVERSITY, EQUITY, AND INCLUSION

AI must be designed, deployed, and used in ways that best avoid unwanted bias, reduce inequalities, and promote fair access and representation across the university. This includes regularly assessing AI systems for bias and discriminatory effects, ensuring inclusive design and accessibility, and supporting equitable participation and representation, also considering access to AI applications.

3.2.7. ENSURE SUSTAINABILITY AND ENVIRONMENTAL RESPONSIBILITY

AI must be designed, deployed, and used in ways that are environmentally and socially sustainable as well as institutionally responsible. This includes minimizing the ecological impact,

supporting long-term financial viability, and strengthening resilient, future-proof academic structures. AI may also be utilized to contribute to environmental and social sustainability by, for instance, improving resource and energy efficiency gains.

3.2.8. ENSURE EFFICIENCY AND QUALITY

AI must be designed, deployed, and used in ways that improve efficiency (e.g., through automation of workflows) and the quality of products and services, not only lowering costs or accelerating processes. This includes using AI in ways that measurably improve, e.g., quality, reliability, and user experience, while ensuring that efficiency gains do not come at the expense of, e.g., academic standards or fairness.

3.2.9. ENSURE HUMAN-CENTEREDNESS

AI must be designed, deployed, and used in ways that preserve human oversight, responsibility, and judgment, ensuring, e.g., that automation serves institutional values rather than replacing accountability. This includes clearly defining human responsibilities, maintaining meaningful human oversight, and the possibility to intervene, as well as strengthening AI competencies so that AI can be used critically and responsibly.

3.3 NAVIGATING TRADE-OFFS

These principles will inevitably create tensions. For example, pursuing state-of-the-art performance by using commercial AI services may come at the cost of data sovereignty, long-term autonomy, or compliance risk. Similarly, maintaining high standards of scientific transparency and openness may limit the use of certain high-performing, closed-source models. Promoting diversity, equity, and inclusion may require additional checks and human oversight, which slows down automated processes.

When such conflicts inevitably arise, the university must make deliberate and transparent decisions about which principles to prioritize in specific contexts. Prioritizing one principle over another entails increased risk — and governance must ensure that those risks are recognized, documented, and, where possible, mitigated. These are not once-and-for-all decisions but ongoing judgments requiring continuous monitoring and institutional learning.

To support this, the university will develop structured mechanisms for principled and transparent decision-making. These include the design of decision matrices, the documentation of key choices, the systematic assessment of risks, and internal review processes involving relevant stakeholders. Aside from further developing AI governance, the university adopts a multi-stakeholder approach, recognizing that effective AI adoption depends on the meaningful engagement of students, researchers, educators, administrative staff, and leadership alike. In this way, AI governance remains open to experimentation and adaptation — while protecting the values and principles that define UoC's mission.

4. PERSPECTIVES ON AI AND UNIVERSITY MISSIONS AND DOMAINS

To structure the complex field of AI at the UoC and to attempt to address it holistically, we choose the "Perspectives-on-AI" approach (Busse/Kleiber 2025). Perspectives are specific vantage or focus points from which AI can be looked at, reflected on, and linked to, e.g., missions and domains. Each perspective comes with its own assumptions, points of view, goals, etc. Hence, combining multiple perspectives allows us to broaden our understanding of both AI and the specific applications of AI within missions and domains.

For example, looking at research, one perspective is that of "Research on AI", which refers to how research advances AI. Another one is "Research with AI," referring to how disciplines use AI for their research. Similarly, in education, we can, e.g., differentiate between "Teaching with AI", "Learning with AI", and "Learning AI". From each perspective, different, sometimes competing, questions, e.g., related to technology, compliance, or risks, arise.

Hence, these perspectives can be seen as a tool for drawing connections, widening the picture, reflection, and both strategic and operational planning. Furthermore, the perspectives help to identify stakeholders and to consider the various roles they may carry.

4.1 EXEMPLARY PERSPECTIVES ON AI

Although we could focus on individual perspectives, there are various important and often interlinked perspectives associated with each university mission and domain. In addition, there are a number of meta-perspectives that can be considered in all cases.

Table 1 structures the perspectives on AI across missions and domains and provides exemplary perspectives for each.

Exemplary Perspectives on AI
Meta-Perspectives
AI and Quality (Management)
AI and Diversity, Equity, and Inclusion
AI and Ethics and Responsibility
AI and Cooperation and Networking
AI Transformations in Research
AI Research
Research with AI
AI and Good Scientific Practice
AI and Research Data

AI and Open Science
AI and Inter- and Transdisciplinary Research
AI Transformations in Teaching and Learning
Teaching with AI
Learning with AI
Learning AI
AI and (Digital) Education
AI and Assessment
AI and Educational Technology
AI Transformations in Transfer
AI and Societal Impact
AI and Innovation
AI and Entrepreneurship
AI and Science Communication
AI Transformations in Management and Administration
AI and (Science) Management
AI Governance
AI and Process Optimization
AI and Compliance
AI and Support
AI and Human Resources
AI Projects
AI Transformations in Infrastructure
AI and (Digital) Sovereignty
AI and Research/Teaching/Learning Infrastructure
AI and Compute
AI and Sustainability
AI and Other Technologies
AI and Digitization and Digital Transformation

Table 1 – Exemplary Perspectives on AI

Of course, this selection does not even start to cover all possible perspectives. In particular, there are many more "meta-perspectives" that can be considered irrespective of the mission or domain.

Ultimately, the goal of this approach is to highlight and operationalize the complexity of AI. Furthermore, the perspectives can serve in two ways. Firstly, we can ask ourselves which perspectives are necessary to approach specific questions and topics holistically. Secondly, we can assess such questions and topics through the lens of one specific perspective, allowing us to better understand, e.g.,

challenges and opportunities linked to it (cf. Busse and Kleiber 2025: 75).

Doing so also serves as a tool for prioritization and focus. Hence, in the following, for each mission and domain, selected perspectives – particularly relevant to the UoC at this moment – are highlighted.

Aside from using the approach to steer strategic focus, the perspectives-on-AI approach will be introduced as a standard tool for approaching and discussing AI-related questions at the UoC.

DISCIPLINES AND SUBJECTS

This strategy primarily targets AI at the overarching institutional level and does not make recommendations or set goals for specific disciplines and subjects.

However, because AI has the potential to have profound effects, every discipline and field has a fundamental responsibility to assess both AI's role within its own practice and its implications across missions and domains.

4.2 UNIVERSITY MISSIONS AND DOMAINS

In the following, the selected perspectives for each mission and domain addressed by this strategy are outlined. This includes a brief outline of exemplary applications, a set of foundational objectives as well as selected pathways to implementation.

This section forms the strategic heart of our AI implementation plan by providing orientation with regard to areas which the UoC wants to focus on, key objectives guiding the UoC's actions, and with regard to where AI will deliver genuine value.

The following table outlines the addressed missions and domains and provides examples for high-level opportunities and challenges identified during the strategy process. These opportunities and challenges form the basis for the outlined objectives.

Mission or Domain	Opportunities	Challenges
Research	Consolidating research activities across the UoC. Continuing to strengthen the foundations for excellent AI-related research (e.g., research infrastructure, methodology).	Lack of foundational AI research aside from AI methodology and data science. Dependency on the AI expertise of partner institutions.
Teaching and Learning	Strengthening UoC's position as a value-	Lack of standardization and coherent

	driven institution focused on AI education, especially also in teacher education. Increasing the quality of teaching and learning through the use of AI.	implementation as well as high degrees of decentralization. Widely different levels of readiness, including AI competencies and policies. Challenges with regard to legacy forms of assessment.
Transfer	Strengthening UoC's capacity to translate AI-related research into societal impact by leveraging existing transfer structures. Leveraging Cologne's rich AI landscape for transfer.	Challenges with regard to the fragmented nature of the UoC's AI activities. Lack of both AI and transfer competencies, especially given the complex nature of AI.
Management and Administration	Optimizing managerial and administrative processes using AI. Leveraging the UoC's existing sovereign and secure AI infrastructure.	Lack of AI readiness with regard to (process) digitization. Challenges associated with compliance, trust, and staff readiness in a decentralized setting.
Infrastructure	Strengthening UoC's position as a provider of sovereign, open, and high-performance AI infrastructure in NRW. Building integrated, interoperable, and user-centered AI infrastructure through a hybrid approach combining self-hosted and commercial services.	High investment, development, and maintenance costs while being in a difficult budgetary situation. Fragmented systems, limited interoperability and missing standardization.

Table 2 – Missions and Domains – Opportunities and Challenges

In the following, these missions and domains will be looked at in more detail, also outlining concrete objectives and pathways to implementation.

4.3 AI TRANSFORMATION IN RESEARCH

The UoC is home to vibrant and diverse research in AI, not only in core fields such as computer science, but across all fields, from the physical and life sciences to the humanities and social sciences. AI-related work at UoC ranges from foundational developments, e.g., in data and computer science, to applied, interdisciplinary investigations.

PERSPECTIVES IN FOCUS

Research with AI

This perspective focuses on research that utilizes AI, especially methods from machine learning, to conduct research. AI might be used throughout the whole research process. This includes, e.g., planning and communicating research projects.

AI Research

This perspective focuses on research that targets AI – in a broad sense – as the primary subject of inquiry (e.g., in computer science). This research might range from developing methods to researching the societal impact of AI.

4.3.1. APPLICATIONS IN RESEARCH

Focusing on the perspective of "Research with AI", AI supports, e.g., data analysis, simulations and diagnostics across disciplines, including, e.g., medicine, natural sciences, economics, and the humanities. It also helps with literature and data discovery and synthesis, hypothesis generation, and research workflows.

Furthermore, we identified the development and use of custom models, which can be trained and deployed on local infrastructure, as a key area of growth. We are also increasing our efforts with regard to methodology ("AI Research"), enabling our researchers to leverage AI within their diverse research projects and workflows.

4.3.2. FOUNDATIONAL OBJECTIVES RELATED TO RESEARCH

Within research, the UoC will

1. strengthen its foundational AI research as well as consolidate its position as a research hub across disciplines,
2. attract AI talents and create new AI-related professorships,
3. develop guidelines as well as the necessary infrastructure to accelerate AI adoption within research,
4. support researchers as they explore the methodological and epistemological implications of AI and adopt AI within their research,
5. facilitate the safe, ethical, and value-driven adoption of AI methods in research,
6. consolidate its AI-related research activities by bringing together researchers across the university.

4.3.3. IMPLEMENTATION

The UoC is advancing AI capacity in research through the establishment of new professorships, a continued emphasis on data science and methodology, the development of central collaborative structures, and the expansion of AI infrastructure for research. A key priority is to enable researchers to efficiently and easily train, fine-tune, and run their own models on trustworthy and powerful infrastructure.

4.4 AI TRANSFORMATION IN TEACHING AND LEARNING

The UoC has long embraced AI in teaching and learning, making it part of its Mission Statement Teaching and Learning in early 2022:

> "The University of Cologne also supports the digital sovereignty of all stakeholders and works towards an informed, critically reflected, ethically and socially-responsible handling of small and big data as well as artificial intelligence."

The UoC will now focus on systematically bringing AI into its curricula and enable both educators and learners to leverage AI in meaningful ways. It will also strengthen its position as a leading institution within NRW and Germany with regard to value-driven AI education.

PERSPECTIVES IN FOCUS

Teaching with AI

This perspective focuses on teaching with AI, e.g., leveraging AI in the design of learning experiences and materials, having AI assist with assessments, or deploying AI-based co-teachers and tutors assisting students 24/7.

Learning AI

This perspective focuses on the development of AI competencies and AI literacy. We believe that it's crucial to consider the AI competencies of all UoC members, not just students. Without developed AI competencies, meaningful AI adoption as well as meaningful AI education will be impossible.

4.4.1. APPLICATIONS IN TEACHING AND LEARNING

Focusing on "Teaching with AI," AI can support the full range of teaching activities, from curriculum and learning experience design to the facilitation of active, adaptive, and individualized learning, as well as AI-enhanced assessment. Similarly, AI can be leveraged, e.g., to support personalized learning, individual tutoring and feedback, and self-directed learning.

A key focus is also on the development of AI competencies and AI literacy across the UoC ("Learning AI"). Here, we are focusing on baseline AI competencies for all as well as fostering both meta-disciplinary and disciplinary competencies across all fields and subjects.

4.4.2. FOUNDATIONAL OBJECTIVES RELATED TO TEACHING AND LEARNING

Within teaching and learning, the UoC will

1. systematically integrate the development of meta-disciplinary and disciplinary AI competencies within its curricula,
2. achieve baseline AI literacy across all of its students and staff,
3. create learning opportunities specifically geared towards qualifying educators, researchers, and university staff to adopt AI in a meaningful and value-driven way,
4. remodel its approach to teaching and learning, including the design of learning experiences and assessment, to be aligned with the requirements of an AI-driven world,
5. position itself as a leading institution within Germany when it comes to AI education,
6. ensure equitable access to AI-related and AI-enhanced educational opportunities across its students and beyond.

4.4.3. IMPLEMENTATION

The UoC is focusing on establishing new AI professorships focused on AI in education, developing (baseline) AI competencies, and systematically identifying and integrating (meta-)disciplinary AI competencies across its curricula. In addition, the UoC will establish additional support structures for both educators and learners, e.g., providing best practice examples and tools for teaching AI and learning with AI. The UoC will also continue to be part of state-wide initiatives and projects and to contribute to the discussion on value-driven AI education.

4.5 AI TRANSFORMATION IN TRANSFER

The UoC sees AI as a major opportunity to strengthen transfer across all four fields of action in the Transfer Strategy: communicating, consulting, application, and further education. Building on its existing transfer structures and the broader AI ecosystem in Cologne and the Rhineland, the UoC aims to translate AI-related research more systematically into societal, cultural, and economic impact.

PERSPECTIVES IN FOCUS

AI and Societal Impact

This perspective focuses on the potential impact of AI in society and the role a (public) university plays within that. The societal impact might range from effective AI science communication to educating the next generation of AI-aware teachers.

AI and Entrepreneurship

This perspective focuses on the potential of translating the diverse and rich AI-related research conducted at the UoC into start-ups and other entrepreneurial activities.

The UoC aims to position itself as a leading hub for AI-related transfer and as a trusted public actor shaping how AI is communicated, applied, and critically reflected in society.

4.5.1. APPLICATIONS IN TRANSFER

Focusing on the perspectives of "AI and Societal Impact" and "AI and Entrepreneurship," AI can support transfer across all four fields of action. This includes, e.g., AI-enhanced science communication and public engagement, AI-informed policy advice, bringing AI into teacher education, the translation of research into practical applications, as well as AI start-ups.

At the same time, AI can serve as both an object and an enabler of transfer. On the one hand, AI-related research results can be translated into societal, cultural, and economic impact. On the other hand, AI can be used as a tool to strengthen transfer itself, e.g., through tailored communication.

4.5.2. FOUNDATIONAL OBJECTIVES RELATED TO TRANSFER

Within transfer, the UoC will

1. strengthen its capacity to rapidly translate AI-related research into societal impact across all fields of action,
2. establish itself as a leading AI start-up ecosystem in the Rhineland,
3. build and leverage AI-related transfer competencies across the university,
4. strengthen and extend partnerships inside and outside of Cologne related to AI,
5. become the leading university for AI-aware (continued) teacher education within North Rhine-Westphalia,
6. leverage AI to expand its outreach and strengthen its (science) communication.

4.5.3. IMPLEMENTATION

The UoC will strengthen AI-related transfer by aligning its activities with the four fields of action and by building the structures, competencies, and partnerships required for rapid and visible impact. This includes, e.g., supporting AI-related start-ups, strengthening science communication, expanding AI-related continuing education offers, particularly in teacher education, and building the AI-related network in Cologne and the Rhineland.

A key priority is to make AI transfer more systematic and more visible across the university. To this end, the UoC will further develop support structures, funding instruments, and strategic partnerships.

4.6 AI TRANSFORMATION IN MANAGEMENT AND ADMINISTRATION

The UoC regards AI as an important enabler for improving management and administration, but also recognizes that meaningful adoption depends on digitized, standardized, and trustworthy processes as well as AI competencies and AI literacy. AI in this domain is therefore closely linked to broader organizational development, combining, e.g., process optimization, service improvement, staff enablement, and governance.

PERSPECTIVES IN FOCUS

AI Projects

This perspective focuses on the various and diverse AI-related projects and how they are interconnected with each other as well as with other initiatives and projects as well as questions such as digitization and organizational change within the university.

AI and Process Optimization

This perspective focuses on opportunities for process optimization, whether through traditional digitization or AI-enhanced services. Doing so raises, e.g., complex questions of autonomy, changes in how we work, and the underlying preconditions.

4.6.1. APPLICATIONS IN MANAGEMENT AND ADMINISTRATION

Focusing on "AI Projects" and "AI and Process Optimization," AI can support a wide range of managerial and administrative activities. This includes, e.g., workflow automation, intelligent document processing, AI-assisted support and consultation, data-driven decision support, and quality management. Furthermore, AI can support individual staff members, e.g., with regard to communication, information management, or transcription, and enable them to go beyond repetitive tasks.

At the same time, the use of AI in management and administration is closely tied to questions of trust, compliance, digitization, and organizational change.

4.6.2. FOUNDATIONAL OBJECTIVES RELATED TO MANAGEMENT AND ADMINISTRATION

Within management and administration, the UoC will

1. implement an AI governance that is supporting the compliant and value-driven adoption of AI,
2. create a single point of entry for all questions related to AI at the UoC,
3. optimize managerial and administrative processes by increasing digitization efforts and leveraging AI,
4. increase its quality and level of service, e.g., related to providing support to both staff and students,

5. strengthen its quality management by leveraging AI in collecting, monitoring, and analyzing data,
6. continuously educate its staff and enable them to adopt AI in a meaningful, safe, compliant, and value-driven manner.

4.6.3. IMPLEMENTATION

In many cases, AI will only be able to create value where core processes, data flows, and documents are already sufficiently digitized and standardized. Therefore, AI must be understood not as an isolated technology layer, but as part of a broader transformation of administration and management.

Therefore, the UoC will advance AI adoption by combining, e.g., AI governance with continued digital transformation. A key focus lies on identifying high-value use cases, e.g., in areas such as knowledge management, document handling, and support, while ensuring compliance, trustworthiness, and alignment with institutional values and principles.

To enable this, the UoC will further develop its AI governance and support structures, invest in the competencies of its staff, and integrate AI adoption within its existing digital transformation efforts. Doing so, existing and proven structures, most importantly the ongoing digitization efforts and the established multi-project management, will be leveraged. In addition, opportunities and use cases will be continuously monitored and developed, e.g., within "AI Labs" specifically targeting the AI transformation in management and administration.

4.7 AI TRANSFORMATION IN INFRASTRUCTURE

The UoC already holds a strong position in the development and provision of sovereign, open, and high-performance AI infrastructure and aims to build on this strength strategically.

In the context of rapidly growing demand for compute, data services, and secure AI applications, infrastructure is not only a technical prerequisite but a central enabler of responsible AI adoption across all missions and domains.

PERSPECTIVES IN FOCUS

AI and (Digital) Sovereignty

This perspective focuses on the increasing need for (digital) sovereignty and targets, e.g., questions of developing and maintaining AI infrastructure ourselves. It is also linked to questions of in-house competency and the negotiation of trade-offs such as price vs. sovereignty, features vs. data security, etc.

AI and Research/Teaching/Learning Infrastructure

This perspective focuses on the infrastructural needs and requirements of researchers and educators, as well as the user experience. It is also closely tied to questions of managing requirements, standardization and financing AI infrastructure.

In this context, the UoC wants to build on existing strengths and provide first-in-class sovereign, trustworthy, and secure infrastructure enabling AI adoption across all missions and domains, including the ability to support diverse AI-related projects, bring-your-own model scenarios, etc.

4.7.1. APPLICATIONS OF AI INFRASTRUCTURE

Focusing on "AI and (Digital) Sovereignty" and "AI and Research/Teaching/Learning Infrastructure," AI infrastructure provides the technical and organizational foundations for AI adoption across all missions and domains. This includes, e.g., high-performance computing (HPC) for model training, inference, and simulations; secure environments for sensitive data; development environments; and shared platforms for data, models, and workflows.

In addition to compute, providing both stand-alone AI applications and AI services within existing applications (e.g., Learning Management System, Document Management) allows users to leverage AI in their work.

4.7.2. FOUNDATIONAL OBJECTIVES RELATED TO INFRASTRUCTURE

Within infrastructure, the UoC will

1. provide sovereign and state-of-the-art infrastructure, utilizing a hybrid approach of both commercial and self-hosted services, to all members of the university,
2. continuously increase its compute capacity, including the competencies to support and utilize them,
3. strengthen its position within North Rhine-Westphalia as an innovative and powerful AI service provider focused on sovereignty and openness,
4. consolidate and standardize AI infrastructure to ensure interoperability and provide a seamless user experience,
5. increase its energy efficiency and strengthen sustainability with regard to AI compute and associated services,
6. support researchers, educators, and staff in the development and adoption of AI applications, especially within the sandbox track.

4.7.3. IMPLEMENTATION

The UoC will continue to expand its AI infrastructure through a hybrid approach combining self-hosted, sovereign services with carefully selected commercial solutions where appropriate. A central priority is to provide reliable, secure, and user-oriented AI infrastructure that supports the diverse needs of research, teaching and learning, transfer, as well as management and administration. This includes expanding compute and inference capacities, strengthening data- and model-related services, professionalizing operations and support, and improving interoperability across systems.

At the same time, the UoC will further build the competencies and partnerships required to develop, maintain, and govern this infrastructure sustainably.

5. ESSENTIAL REQUIREMENTS AND IMPLEMENTATION

Three structural challenges make AI adoption particularly demanding for large public universities such as the UoC. First, the pace of technological change leaves little time to adapt, especially for large institutions with complex decision-making structures. Second, the scale of required investment poses difficulties for resource-constrained environments. Third, AI adoption brings growing legal and ethical compliance demands, notably under the EU AI Act and related regulations. These challenges require universities to have fast and informed decision-making processes as well as to balance agility and responsibility with regard to AI-related actions.

5.1 ESSENTIAL REQUIREMENTS

The successful implementation of AI and the success of this strategy are closely related to a series of essential requirements leading to institutional readiness.

While we are purposefully using the term “building” in the following to highlight the tasks at hand, all of these essential requirements need continuous maintenance and care. Therefore, establishing forward-looking and sustainable structures, including great quality management, is as important as creating institutional readiness in the first place.

5.1.1. BUILDING AN AI CULTURE

Building a value-driven and collaborative AI culture is the connective tissue that binds governance, infrastructure, competencies, practical projects, and partnerships into lived everyday practice. A culture that is curious, reflective, and grounded in values is essential for this strategy not to stay toothless.

There are four primary building blocks on which we will focus: Firstly, a shared language as well as shared values and principles will establish common ground. Secondly, clear and trustworthy governance, including processes and instruments such as the dual-track approach, will provide a common framework for AI-related actions and enable UoC members to act confidently. Thirdly, through continuous AI education and valuing AI expertise, we will keep UoC’s members ahead and reduce both fear and uncertainty. Finally, making AI-related actions, e.g., as best practice examples, visible, as well as funding and awarding projects, will embed AI within UoC’s cultural fabric.

Failing to do so will likely allow fear of mistakes, compliance concerns, and misleading assumptions to stifle innovation, while undocumented gray-zone practices will proliferate.

5.1.2. BUILDING STRATEGIC AND OPERATIONAL ALIGNMENT

AI adoption at the UoC requires strong alignment between strategic goals and operational implementation across all missions and domains and between stakeholders. This means ensuring that AI-related activities are coordinated with, e.g., existing institutional strategies, governance structures, digital transformation efforts, and existing projects rather than developing in parallel or isolation.

Building such alignment as well as structures and formats to foster exchange and collaboration helps reduce duplication, supports coherent decision-making, and creates the conditions for responsible, effective, and scalable AI adoption across the university.

Failing to do so will likely result in fragmented initiatives, duplicated efforts, and contradictory priorities, reducing the UoC's ability to act coherently, scale successful approaches, and translate strategic goals into effective operational practice.

5.1.3. BUILDING FORESIGHT AND FUTURES RESEARCH CAPABILITIES

Building (strategic) foresight and futures research capabilities is essential to ensure long-term institutional resilience and successful continuous renewal given the rapid development and integration of AI. These capabilities are needed, especially also considering the significant cost and risks involved, to inform decision-making at all levels by, e.g., assessing possible future developments and testing current policies and approaches against diverse scenarios.

These foresight and futures research activities need to be highly inclusive, integrating as many disciplinary and meta-disciplinary perspectives as possible.

Failing to do so will most likely leave the UoC in a reactive rather than a proactive and shaping position, increasing the risk of strategic misinvestment, missed opportunities, and insufficient preparedness for rapid technological and regulatory change.

5.1.4. BUILDING GOVERNANCE, PROCESSES, TRUST, AND CLARITY

Building efficient and functioning AI governance, fundamental processes, trust, and clarity are fundamental for harnessing the potential of AI at the UoC, especially given its size and decentralized model. They enable the implementation of AI in an agreed-upon and trusted manner, reducing uncertainties and insecurities, e.g., regarding the use of AI in highly regulated areas such as teaching and learning or management and administration.

Doing so, the UoC will need to find a balance between potentially innovation-hindering regulation and symbolic, toothless declarations that do not provide clarity in day-to-day decision-making.

Failing to provide these will most likely result in either non-action or further fragmentation and gray area practices, not only hindering collective progress and innovation but also putting both individuals and the organization at risk.

5.1.5. BUILDING INFRASTRUCTURE

Building sovereign, powerful, scalable, and well-maintained infrastructure determines the scope, scale, and effectiveness of AI application within the institution and across all missions and domains as well as, for example, research readiness.

Outlining all aspects of technical AI infrastructure goes beyond the scope of this strategy, but in general, we are focusing on three areas. Firstly, fundamental technical infrastructure with a focus on scalable compute resources and HPC – Cologne being a tier 2 center within NRW – at the core. Secondly, AI inference capabilities. Here, UoC, as it has already begun (OSKI.nrw and now KI:Expertisezentrum.nrw), will establish itself as a key player when it comes to providing open, trustworthy, and sovereign AI inference, being an enabler for various applications across missions and domains. Finally, a use-case-driven and well-integrated application layer providing AI applications, from general-purpose AI chatbots to specialized tools, for all missions and domains.

Simultaneously, for this infrastructure to unleash its potential, there are three related required areas of action: Firstly, core processes and data, e.g., within management and administration, need to be digitized. Secondly, the data and application landscape at UoC needs to be harmonized and integrated. Finally, all infrastructure needs to be further developed, maintained, and supported by experts, especially also considering questions of security and compliance.

Failing to do so will most likely leave AI initiatives fragmented and inefficient, forcing teams to recreate redundant and likely worse technical solutions, increasing costs, environmental impact, technical debt as well as security and compliance risks.

5.1.6. BUILDING COMPETENCIES

Building competencies and creating knowledge are core missions of every university. The availability of highly competent and motivated people determines how far and how fast the UoC can translate technical capability into outcomes across its missions and domains. This holds true for all members of the UoC, including leadership, which requires comprehensive AI competencies to navigate the landscape. Building competencies, aside from enabling excellent research, teaching, and learning, is also crucial with regard to building the aforementioned sovereign infrastructure.

There are four primary areas that UoC will need to focus on. Firstly, the UoC will need to establish a shared understanding of AI competency and literacy that serves as a basis for all other actions. Secondly, recruitment and talent management, e.g., related to job descriptions and evaluation, but also recruitment workflows, need to be adapted to the AI landscape. Thirdly, not just focusing on AI, knowledge management, and knowledge transfer, e.g., regarding best practices, will be crucial, especially given the rapidly changing landscape. Finally, and most importantly, continuous AI education, including domain- and discipline-specific competencies, is necessary from both a compliance and an implementation perspective. This will require us to increase our AI education offerings, not just for students, and establish additional support structures.

Failing to do so will likely hinder us from leveraging and expanding existing infrastructure, widen existing competency gaps, introduce compliance risk, reinforce cultural resistance, and prevent promising AI projects from moving beyond isolated pilots.

5.1.7. BUILDING PARTNERSHIPS

Building and extending strong partnerships and networks is essential because the UoC cannot solve AI challenges alone. External expertise, resources, and perspectives expand our capacity to implement AI responsibly and at scale, anchoring the university within a dynamic and expanding regional, national, and international ecosystem. Furthermore, strong partnerships are required to shape both discourse and policy more effectively.

There are three primary partnership domains on which we will focus. Firstly, strategic cooperations with peer institutions, e.g., within NRW, will accelerate both infrastructure development as well as projects across missions and domains. Secondly, policy engagement and advocacy will position the UoC as a trusted voice, e.g., in areas such as trustworthy, sovereign, and open AI, and help with funding as well as impact. Finally, industry partnerships, ranging from local start-ups (e.g., also within Gateway and the Gateway Factory) and SMEs to global technology leaders, will translate research into practice, offer access to cutting-edge technology, data, and research, and strengthen the talent pipeline in both directions.

Failing to do so will likely limit the UoC's ability to implement large-scale projects, increase its isolation from important developments, reduce its policy influence, and create positioning disadvantages in attracting talent and resources.

5.2 DUAL-TRACK APPROACH

As described in the previous chapter, a key requirement for successful AI adoption is achieving speed and agility within a highly complex environment while remaining true to the values and principles outlined in this strategy.

Therefore, AI adoption at the UoC requires differentiated pathways. Not all applications and AI-related actions are equally mature, equally risky, or equally ready for institutional use. While some can be adopted directly on the basis of existing evidence and clear operational value, others require controlled experimentation before broader deployment can be justified.

The Dual-Track Approach enables the UoC to combine timely implementation with responsible testing, thereby supporting both institutional agility and compliance.

5.2.1. TWO TRACKS TOWARDS IMPLEMENTATION

Since a single implementation approach cannot achieve both objectives effectively, we establish two distinct pathways: one for mature AI-related actions ready for immediate deployment, and another for experimental actions requiring experimentation, controlled testing, and evaluation.

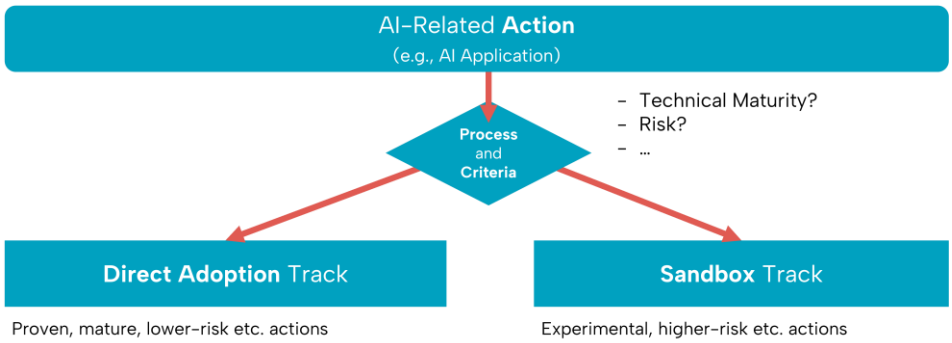

Figure 2 – Dual-Track Approach – Process

The Direct Adoption Track enables immediate implementation of AI-related actions (e.g., the introduction of an AI application) with proven benefits and clear deployment pathways. The Sandbox Track provides controlled testing and evaluation environments for experimental implementations requiring evidence-building before broader adoption.

This approach embodies our commitment to responsibility by design, human-centeredness, and agility by providing suitable implementation methods for each situation.

Track	Purpose	Examples
Direct Adoption	Immediate implementation of mature AI-related actions	Low-risk AI applications using public data Tested AI applications in non-high-risk environments Highly mature AI applications with a long track record
Sandbox	Controlled testing and evaluation environments for experimental AI-related actions	High-risk AI applications using internal and sensitive data High-risk AI applications in regulated areas (e.g., assessment, administration) Experimental AI applications without a prior track record or insufficient testing

Table 3 – Dual-Track Approach – Purpose and Examples

5.2.2. PROCESSES

The Dual-Track Approach is based on a series of processes, which are outlined below. There will also be an accompanying document describing the approach in more detail.

5.2.2.1. Proposal Process

Members of the UoC can propose AI-related actions through a streamlined process designed to encourage broad participation regardless of technical background.

UoC members can contact the AI Office to propose an AI-related action that will trigger the acceptance and decision process. In addition, the UoC, via the AI Office, will issue university-wide calls to stakeholders that may benefit from AI implementation.

Proposals will be made using a standardized process and standardized templates, providing information necessary for the acceptance and decision process. This includes, e.g.,

1. A description of the AI-related action
2. Information regarding the positioning as well as alignment with other initiatives, strategies, actions, etc.
3. Information regarding the involved stakeholders and the available expertise
4. Information regarding the expected value and potential risks
5. Information regarding resource requirements, the proposed timeline, success metrics, etc.
6. An initial assessment of ethical, legal, and compliance-related questions

5.2.2.2. Acceptance and Decision Process

Based on the proposals and acceptance as well as track criteria, AI-related actions will either be accepted or denied and assigned to either track. If a proposal is (continuously) denied, it will fall out of the Dual-Track Approach and will not receive further support through the centralized processes.

After a proposal has been accepted, the track assignment considers multiple factors such as implementation maturity, potential impact, required resources, regulatory and technological complexity, and risk.

The proposals will be evaluated against these criteria by established bodies to ensure that the decisions are transparent and reviewable, with clear documentation of how the criteria influenced each determination.

5.2.2.3. Implementation and Evaluation Process

Depending on the track, the people responsible for the AI-related action will receive support – e.g., regarding the allowlist process (cf. AI Policy) – and the action is accompanied by experts from the AI Office and associated units.

For the Direct Adoption Track, the AI Office supports the people

responsible for the AI-related action during implementation, e.g., by providing necessary information and templates or by coordinating with other units and stakeholders involved.

In the case of the Sandbox Track, based on the specifics of a given AI-related action, an implementation and evaluation plan with clear success criteria and risk mitigations is designed. Then the AI-related action will be implemented as a sandbox with limited scope and oversight.

If a sandbox pilot matures quickly, it may transition to the Direct Adoption track. Otherwise, during the testing and evaluation phase, it will be determined if, when, and how the AI-related action will be implemented outside of the sandbox scope.

5.2.3. ORGANIZATION

The AI Office manages the Dual-Track Approach and, in particular, supports Sandbox Track AI-related actions. This includes, e.g., greenlighting actions, support and consultation, managing implementation and evaluation plans as well as evaluation and monitoring. For decisions and questions with significant legal, ethical, or cross-institutional implications, the AI Office escalates to the CIO-Board.

The AI Office maintains a knowledge base on AI-related actions and evaluation outcomes. Based on these cross-project insights, it enables the UoC to learn from prior experiences. Hence, aside from enabling experimentation, the Dual-Track Approach enables the UoC to build institutional expertise through shared experimentation and learning.

6. AI RESPONSIBILITIES AND QUALITY MANAGEMENT

As a public research-intensive university, the UoC has a responsibility to ensure that AI is adopted in ways consistent with its core values and the principles set out in this strategy.

This is of particular importance as AI is not a neutral technology but fundamentally reshapes processes of, e.g., knowledge production, research, education, and work. This introduces both significant opportunities and risks that need to be addressed.

In addition, from a legal standpoint, AI is also at the intersection of various complex legal and compliance domains, including data protection, information security, copyright, labor rights, the EU AI Act, and many others.

Given the rapid developments in the AI space, the UoC is committed to systematic and continuous quality management and institutional learning. Hence, AI-related processes will also be tightly integrated with the UoC's quality management system Q³UoC.

This section, therefore, outlines key responsibilities and a framework for quality management supporting responsible innovation, risk management, and the alignment of AI-related processes with the principles outlined.

6.1 TASKS AND RESPONSIBILITIES

There are a series of tasks and responsibilities, both stemming from existing regulations (e.g., the EU AI Act) and this strategy, that need to be addressed.

On a strategic and compliance level, they include, e.g., strategic direction and institutional alignment, institutional capacity building, AI culture and change management, policy and regulation development and maintenance, risk management and legal compliance (including, e.g., the establishment and operation of the Article 9 Risk Management System and data governance), AI-related information security, ethical governance and value enforcement, transparency (including, e.g., human oversight) and accountability, AI infrastructure governance, quality assurance and quality development, and managing cooperations, projects, networks etc.

On a more operational level, they include, e.g., the management of the Dual-Track Approach, AI system/application approval and control, project management, monitoring and lifecycle management, compliance and security monitoring and documentation, information collection and management, system and use-case documentation and reporting, training and competency-development, advisory and support, (impact) evaluation, stakeholder engagement and management, as well as communication.

Through the AI Policy, the UoC has established its AI governance, built around the CIO-Board for higher-level and strategic questions and the AI Office, which will also serve as a central coordination hub and the single point of contact for all AI-related questions.

The tasks and responsibilities, some of which have been outlined above, will be shared and coordinated between these established structures. To ensure that faculties, central units, as well as management and administration are represented and to ensure continuous information and decision flow, there will be designated points of contact in each faculty. In addition, AI experts from the UoC might be invited as subject matter experts to assist both the AI Office and the CIO-Board.

In addition to the AI Policy, which establishes AI governance for the university, additional documents will be developed and maintained iteratively.

6.2 QUALITY MANAGEMENT

Quality management for AI-related processes, actions, and AI applications at the UoC will be embedded within the university-wide Q³UoC system. The AI Office will work closely with Q³UoC and other relevant units to ensure that AI-related processes are systematically incorporated into the university-wide quality management.

AI-specific quality management is guided primarily by the protection goals defined in the AI Policy, as well as by the values, principles, and objectives set out in this strategy. Depending on the respective mission or domain, existing structures and procedures, e.g., in research, teaching and learning, or management and administration, should be used wherever possible in order to ensure coherence and avoid unnecessary duplication.

With regard to AI applications, quality assurance is supported through the AI Allowlist of approved applications, maintained and regularly reviewed by the AI Office, as well as the assigned responsible person per application. The Dual-Track Approach and the associated review and approval processes are coordinated by the AI Office in cooperation with Q³UoC and other relevant actors.

Because AI technologies and regulatory requirements are evolving rapidly, quality management must itself remain adaptive. It will therefore be complemented by continuous monitoring, expert consultation, strategic foresight, and the iterative review and further development of both the AI Policy and the AI Strategy.

7.SUMMARY AND NEXT STEPS

This value-driven strategy provides the UoC with a shared, value-driven framework for the responsible adoption, use, and further development of AI across all of its missions and domains. It brings together strategic orientation, common values and principles, overarching objectives, implementation perspectives, essential requirements, governance structures, and quality management mechanisms. In doing so, it is intended not as a rigid roadmap, but as an institutional framework that enables coordinated action, responsible experimentation, and continuous learning in a rapidly evolving field.

PRIORITIES FOR 2026–27

In 2026–27, the university will focus on seven first-phase priorities:

- establishing the AI Office as the central coordination hub,
- attract additional talent and expertise, especially by creating new professorships,
- collecting, synthesize, and provide information about the UoC's AI efforts,
- launching the Dual-Track Approach,
- extending the available AI infrastructure and approved tools,
- rolling out additional learning offers targeting baseline AI competency,
- and supporting a first portfolio of lighthouse use cases and best practices across domains and missions.

The next phase will focus on implementation. This includes operationalizing the Dual-Track Approach, refining implementation guidelines and review processes, and advancing the strategic objectives within the different missions and domains. Particular attention will be given to strengthening institutional readiness, building competencies, supporting existing initiatives, and identifying those projects and use cases that can generate visible value for the university and its members and serve as best practices.

At the same time, the strategy itself must remain adaptive. Given the speed of technological, regulatory, and organizational change, both the AI Strategy and the AI Policy will need to be continuously reviewed and further developed in light of new opportunities, risks, and experiences. In this sense, the strategy should be understood both as a shared point of orientation for the present and as a living framework for the university's ongoing AI transformation.

ABBREVIATIONS

Term	Abbreviation
Artificial Intelligence	AI
Generative Artificial Intelligence	GenAI
University of Cologne	UoC
Chief Information Security Officer	CISO
Chief Information Officer	CIO
IT Center University of Cologne	ITCC

Table 4 – Abbreviations

The UoC maintains a central AI Glossary that provides a common understanding and definition of AI terminology.

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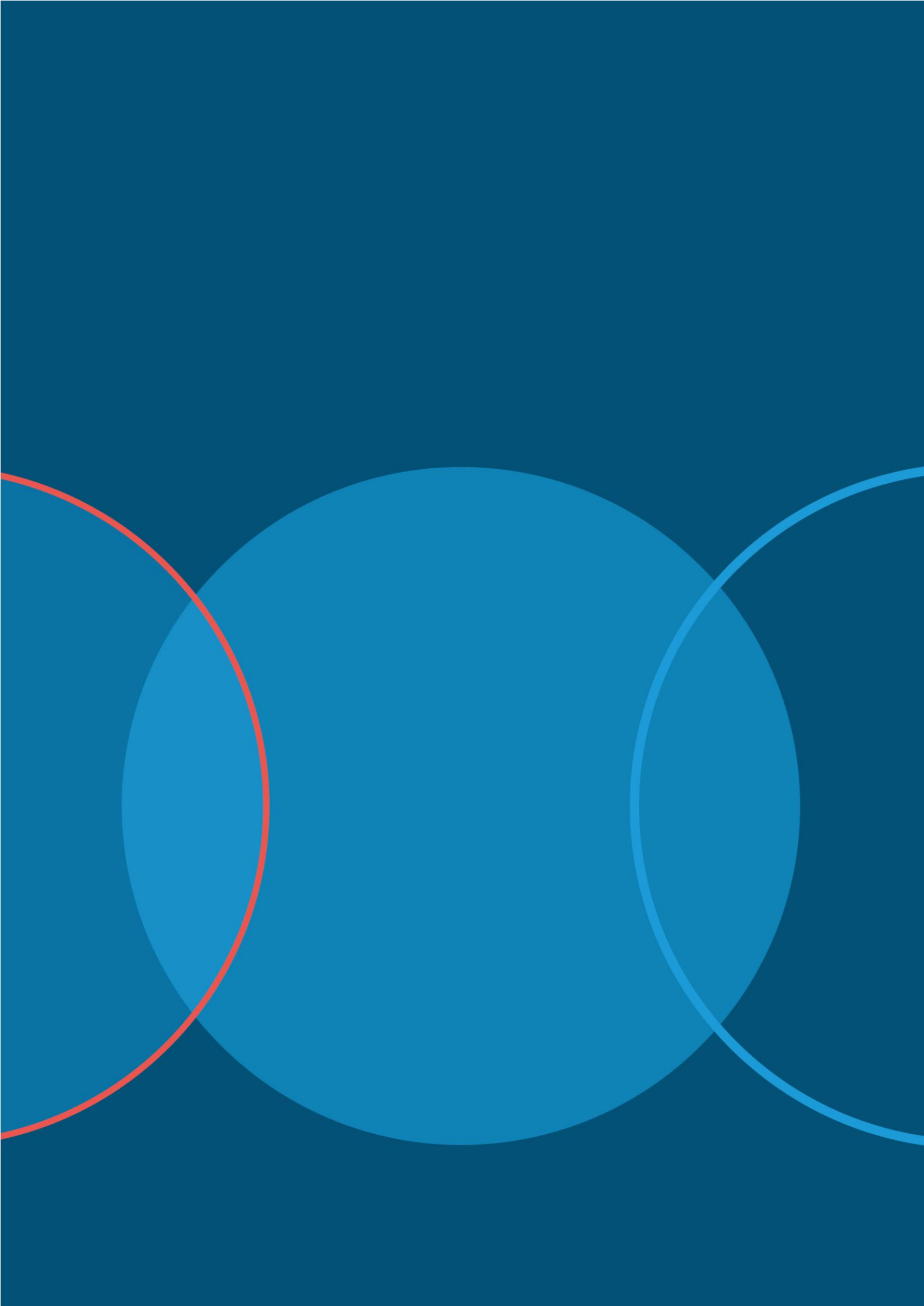
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