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Creating a New Digital Strategy – from Governance to Actions

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Abstract

Since 2010, Münster University has elaborated a succession of IT strategies, each for a five-year period. In 2024, work on a new update commenced, this time with the focus on creating a Digital Strategy, emphasizing the wider scope of not just addressing IT issues, but on managing the impact of digitalization on all the processes in teaching and learning, research and the administrative support. Additionally, a basic element of each IT/digital strategy had also been changed – the IT governance of Münster University, that for very long rested on the 1996 framework, had been updated in 2023, establishing new platforms for exchange, especially three working groups dedicated to the aspects of IT in teaching and learning, research and administration. In this setting, the new digital strategy was developed, and we will present its key aspects here.

1 Environment and Understanding of the Digital Strategy

The University of Münster is one of Germany's largest and most prestigious universities, known for its excellent international standing. With around 43,000 students and 5,600 researchers, it aims to be a key societal institution, emphasizing outstanding research, student-centered teaching, and knowledge transfer. The university leverages technological advancements to enhance performance and manage daily operations. As a research and teaching organization, it promotes digital collaboration among all members, improving data management and access to resources. Digital tools create innovative environments for research, teaching, and transfer, thereby improving administrative workflows and contributing to ongoing optimization. The university perceives digital transformation not as a mere technical change but as an ongoing evolution that impacts how it operates in all domains. Collaborative efforts are essential for successful digital initiatives, requiring synergy among members and technology, with subsequent chapters outlining necessary guidelines for this transformation.

In this spirit, the University has updated its long-established approach to formulating an IT strategy (see University of Münster, 2010 and University of Münster, 2018) and is in 2025 creating a Digital

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Strategy to address the impact of digitalization on all of its processes. This was prepared by an update of the original 1996 IT governance system of the University in 2024 (see University of Münster, 2024a) and a new regulation on the IOT organization of the University (University of Münster, 2024b). The new IT governance establishes a new structure of commissions and boards to plan and oversee IT activities and now features additional working groups on IT affairs in research, studies and teaching, and administration. These new working groups are crucial for a close involvement of stakeholders into the creation of the Digital Strategy.

2 The Expectations for a Digital Strategy

The University of Münster's digital strategy aims to shape the dynamic relationship between the university and emerging technological opportunities. As advancements in information and communication technology continue to evolve rapidly, they challenge existing strategic assumptions. The strategy provides an organizational framework for domain-specific initiatives influenced by digital technologies, such as Digital Humanities, research data management, and Open Access. It formulates guidelines to harness the benefits of digital transformation while identifying associated challenges early. The university emphasizes that new technologies should be seen not just as change factors, but as outcomes of intentional organizational development, focusing on people—staff and students. Their acceptance and understanding are pivotal for the successful implementation of digital initiatives. The change aims to enhance human well-being, and the university remains mindful of the limitations of digital technologies while striving to create a supportive environment for quality work and study experiences.

3 Reacting to the Science Policy Environment

The digital strategy of the University of Münster acknowledges both external and internal dynamics and their feedback loops, shaped by higher education policies such as the mandates of the Ministry of Culture and Science of North Rhine-Westphalia (MKW) and the Higher Education Strengthening Act (see Landesregierung NRW, 2024), which emphasizes digitalization and requires Universities to explicitly establish basic IT governance elements like CIO and CISO. A crucial aspect is cooperation across universities, with the Digital University NRW (DH.NRW, see DH.NRW, 2025) defining thematic action areas relevant to all universities in the state, aiming to enhance shared IT services with high reliability. Utilizing both state services and alternative market solutions is often essential, necessitating careful evaluation of related dependencies.

A functional IT governance framework is vital to the digital strategy, newly established in 2023 and supported by working groups from the IT Commission. Key positions like the Chief Information Officer (CIO) and Chief Information Security Officer (CISO) have been effectively filled, ensuring an organized approach to implementing IT services.

The university recognizes the risks associated with new technologies, specifically concerning information security and data protection, which are integrated into decision-making processes. The BSI baseline protection (BSI, 2025) is being implemented in accordance with cybersecurity agreements. Renewed structures in IT governance have bolstered information security, while standards are set to ensure the integrity of research and educational integrity, enabling secure utilization of digital potentials while outlining necessary boundaries.

Apart from the regulations imposed on the University by the state government, there are additional guiding influences from federal sources in Germany, like the Recommendations for Sovereignty and Security of Science in the Digital Space (see WR, 2023) by the German national Science Council, or

the Theses on the Scientific Information Infrastructures of the Future (see DINI, 2024) by the German Initiative for Network Information (DINI), that have effected their influence on the creation of the Digital Strategy for Münster University.

Figure 1: Concise presentation of the key elements of the basic understanding of digital transformation at the University of Münster.

4 Fields of Tension and Action

The digital strategy at the University of Münster serves as a guiding framework for technical and organizational decision-making across all areas of the institution. It emphasizes that successful digital transformation requires collective effort and active participation from all employees. The university promotes a culture characterized by openness, flexibility, and collaboration, focusing on innovation and user-centric approaches.

4.1. Human Resources as a Key Prerequisite for the Implementation of the Digital Strategy

A critical component of this culture, which is essential for the success of the digital transformation endeavor, is sustainable human resource development. With many long-serving staff members nearing retirement, it is vital to pass on their explicit and implicit knowledge to newer generations to avoid losing expertise. The competitive labor market, especially in IT, necessitates nurturing and retaining existing employees, as well as training young professionals and supervising student theses. An attractive work environment is essential for ongoing development and must consider generational changes in work expectations and the impact of high workloads on motivation and health.

4.2. The Tension between Regulation and Flexibility

Digital technologies can and will significantly support the development of our institution. They are not only a decisive factor for efficiency in certain research areas but also open new or improved options for decision-making processes, training offers, services, and teaching formats. To successfully shape this change and achieve long-term goals, the university develops and maintains needs-based digital services, tools, and infrastructures that neither restrict the freedom nor the responsibility of researchers,

educators, or employees but support them instead. However, it is also essential to comply with guidelines and restrictions, whether in the form of legal regulations like data protection or self-imposed standards, workflows, and policies. Particularly, the sustainable establishment of information security across the university must not be overlooked. Rather than implementing these dogmatically for their own sake, all participants in the IT support system should act pragmatically and effectively. These considerations reveal that two fundamental normative principles confront each other within digital transformation: standardized regulations to ensure information flows, compliance, or safety versus the autonomy and flexibility of decentralized units based on individual needs. An excessive focus on regulations can lead to crippling bureaucracy, while too much diversity in IT solutions can result in inefficiencies and inconsistencies. Resolving this tension requires a nuanced approach that recognizes both the necessity of standardization and the importance of heterogeneous solutions while pursuing common goals. Successful transformation positions itself between governance and creative freedom, where all stakeholders collaboratively shape the digital future.

4.3. The Tension between Effectiveness and Efficiency

This fundamental attitude must also be applied to the question of how to achieve our goals in the coming years. This includes aligning technologies and digital processes with the fulfillment of our daily tasks. Effective solutions help to focus on the long-term targets of departments and operating units while addressing needs comprehensively. Conversely, an efficient approach allows for high benefits with minimal resources, thereby unlocking overall organizational digitalization potential in a shorter time frame. Neither approach excludes the other, so it is essential to balance both implementation modes through purposeful management of all measures. Addressing digital transformation requires both effective solutions for a sustainable increase in performance regarding university tasks and efficient technological measures to reduce effort and improve work quality.

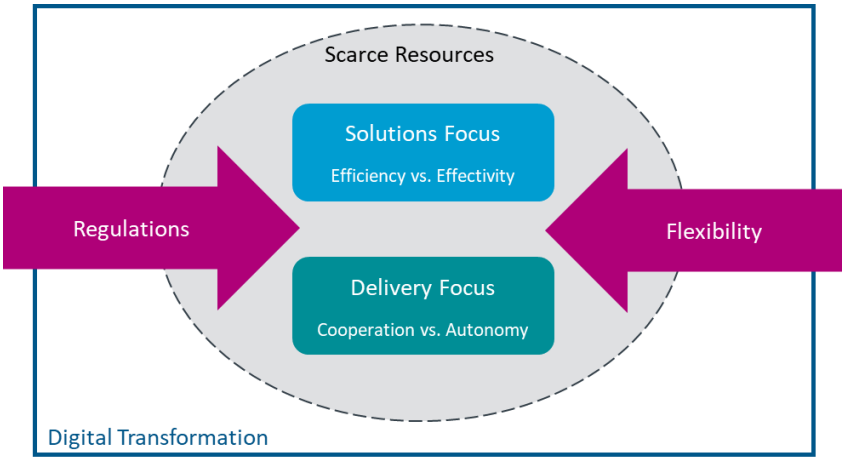


Figure 2: The fields of tension, in which the Digital Strategy is situated.

4.4. The Tension between Autonomy and Cooperation

Assessing how far the University of Münster can implement necessary initiatives is key for effective implementation of strategy. The goal is to achieve technological capability that ensures self-determined use and design of information technology in terms of digital sovereignty. This pertains to the university's involvement in state-wide or consortium projects as well as its position towards commercial providers. Consequently, the University of Münster follows a central recommendation of the Science Council (WR, 2023) regarding a resilient scientific system. High-level capability increasingly depends

on available digital infrastructures today and in the future. It is the university's responsibility to ensure these conditions for unrestricted and free action in research, teaching, and transfer. Securing sovereignty through long-term contracts and partnerships is challenging in a dynamic environment, as large providers often do not consider the academic sector a significant target audience. A more sustainable alternative lies in the university's own resources, infrastructures, and the use of open-source software solutions. The latter is particularly important for the CIT concerning digital sovereignty, as dedicated staff can develop sustainable, needs-based, and cost-effective service offerings. Overall, this approach requires a critical mass and imposes high demands on staffing. Attaining digital sovereignty also requires an appropriate level of security in the digital realm, allowing for free and safe actions. From selecting products to sourcing digital services to implementing security measures, a balanced and pragmatic consideration of risks, justified efforts, and acceptance of limitations is necessary.

5 Measures and Actions

Under considerations of these conditions, the University of Münster identifies and prioritizes various areas of action to achieve its strategic goals. These are shaped not only by the university's internal organizational requirements but also by its integration within the higher education policy framework. On one hand, we orient ourselves according to the seven action areas defined by DH.NRW to strengthen the higher education landscape in the state. These include *innovative infrastructure for study and teaching, research data management, high-performance computing (HPC), cloud and sourcing, next-generation digital support processes, information security, and artificial intelligence* (DH.NRW, 2025). On the other hand, we also reference the theses of the German Initiative for Network Information e.V. (DINI, 2024) regarding the exploration of digitalization potentials in science. These relate to four themes: open science, digital sovereignty, digitalization in study and teaching, and new work. Based on this, alongside applicable frameworks and guiding principles, the university's directional decisions can be categorized into a comprehensive view of the organization and its specific dimensions of research, study and teaching, transfer, and administration.

5.1. Competitive Digital Services for a Future-Ready University

The state government aims to establish cross-university supply centers to standardize IT services and reduce costs. The University of Münster is prepared to take on this responsibility, recognizing the challenges associated with delivering high-quality services, ensuring user satisfaction, developing appropriate and accepted billing methods, and sourcing and financing the necessary infrastructure and personnel resources. The university views this as crucial to its identity, aiming to position itself at the forefront of scientific locations through its capacity for action and willingness to optimally shape digital infrastructures and processes. The university is already in an excellent position, having significantly contributed to cross-university IT projects such as sciebo, Research Data Infrastructure, JupyterHub, CRIS, SAP, and GIT. It also has a strong foundation in HPC, demonstrated by its active participation in the HPC.NRW competency network, extensive experience in centralized HPC operations, and energy-efficient system management. Preparing the necessary spatial resources for the initial establishment is already underway, but funding from the state government for replacements, such as an urgently needed IT data center to ensure high availability for future scientific computing challenges, is crucial. Combined with the existing HPC server room, such a data center will form the backbone of the university's IT infrastructure. Beyond financial considerations, personnel development must begin early and be future-oriented to meet growing IT demands.

Another vital element for the future-proof design and positioning of the University of Münster is the widespread use of artificial intelligence (AI). An organization-wide offering for generative AI, UniGPT (Radas et al, 2025), has been available since early on, featuring both self-hosted open-source

models and commercial cloud services. This offer of AI services is set to expand further, particularly self-hosted open-source large language models (LLMs), which are highly demanded for their advantages in information security and potential for development. Sovereign-operated open-source models are especially important for research due to their transparency, reproducibility, and freedom of choice. AI also opens up new opportunities in areas of study, teaching, and administration. However, as the future becomes increasingly influenced by AI, the university's role extends beyond merely providing technologies. In the coming years, offerings and formats must be created to educate staff and students about how to work with and utilize AI effectively, thereby enhancing their competence in this area.

5.2. Excellence in Research

Digital technologies and services fundamentally influence scientific work across disciplines, and the University of Münster actively supports this transformation through its digital strategy. The strategy aims to create ideal conditions for outstanding research, ensuring a robust local IT infrastructure to meet the demands of current and future top-tier research. This development is intended to boost the university's reputation as a research hub and support collaborations with external stakeholders.

A focus on research data management aligned with the FAIR principles enhances visibility and plays a critical role in the university's public image. Additionally, integrating the Current Research Information System (CRIS) with international metadata repositories is part of the strategy.

The transformation also explores innovative research methodologies, including data analysis and AI applications, while addressing challenges related to data quality and reproducibility. The university is committed to enhancing digital competencies among students and employees, particularly in fields like digital humanities and data science.

Furthermore, research software is identified as a key area to increase efficiency and ensure effective research collaboration. The university plans to provide high-quality software and support the development of international research software. Structural support for Research Software Engineering will be prioritized to facilitate the adaptation of digital methods, with career paths designed to attract skilled professionals and foster optimal support systems for research software.

5.3. Quality in Study and Teaching

The area of study and teaching at the University of Münster is shaped by the interplay between the university's self-understanding and the educational demands of students. The digital strategy addresses didactic, societal, and technological factors that aim to enhance the quality of education. Digital technologies facilitate varied teaching and learning formats while enabling data analysis on learning behaviors and outcomes. The integration of ERP and campus management systems opens internal data sources that improve decision-making, while learning analytics support educators in mentoring and curriculum design, allowing for early interventions.

The university acknowledges the need for dedicated e-examination rooms, and tot prioritize the creation of local facilities for electronic assessments. A well-planned concept for these spaces is crucial to adapt to the evolving digital society's demands. The provision of e-lectures is becoming increasingly important and needs to be further expanded, accommodating those unable to attend local classes due to various constraints.

Additionally, there is significant demand for learning spaces despite existing digital resources and options. The university aims to provide more resources and learning opportunities that meet the needs of acquiring digital competencies. This includes enabling students to learn how to use technologies like AI responsibly, as well as developing essential skills such as problem-solving, creativity, intercultural communication, and adaptability for the job market.

5.4. Digitalization of Administration

Digitalization in administration is shaped by various regulatory influences, including the E-Government Act and the Online Access Act, promoting electronic administrative tasks. However, legal requirements at both state and federal levels, which are not yet optimized for digital processes, create asynchrony and complicate the transition from analog to digital methods. While there are abundant solutions in the digital technology market for public sector challenges, the costs and complexity of diverse regulations remain a concern for the University of Münster.

The interplay of digital technologies presents a challenge as well, with vendors rarely offering comprehensive solutions that address the fragmented administrative landscape. This risk of creating data silos emphasizes the importance of ensuring compatibility and ease of information exchange between systems.

Employee and student expectations heavily influence the design of the digital transformation. In a world accustomed to digital services, the university faces varying levels of digital competency among its staff, while students typically arrive already familiar with these technologies.

Administrative units at the University of Münster are responsible for enabling research and teaching, providing essential support across the institution. The optimization of administrative processes is a core goal, as many traditional practices remain paper-based, which can hinder digital transformation. The university already offers numerous digital services, such as workflows and IT-driven direct self services, enhancing efficiency and speed while providing a basis for further automation.

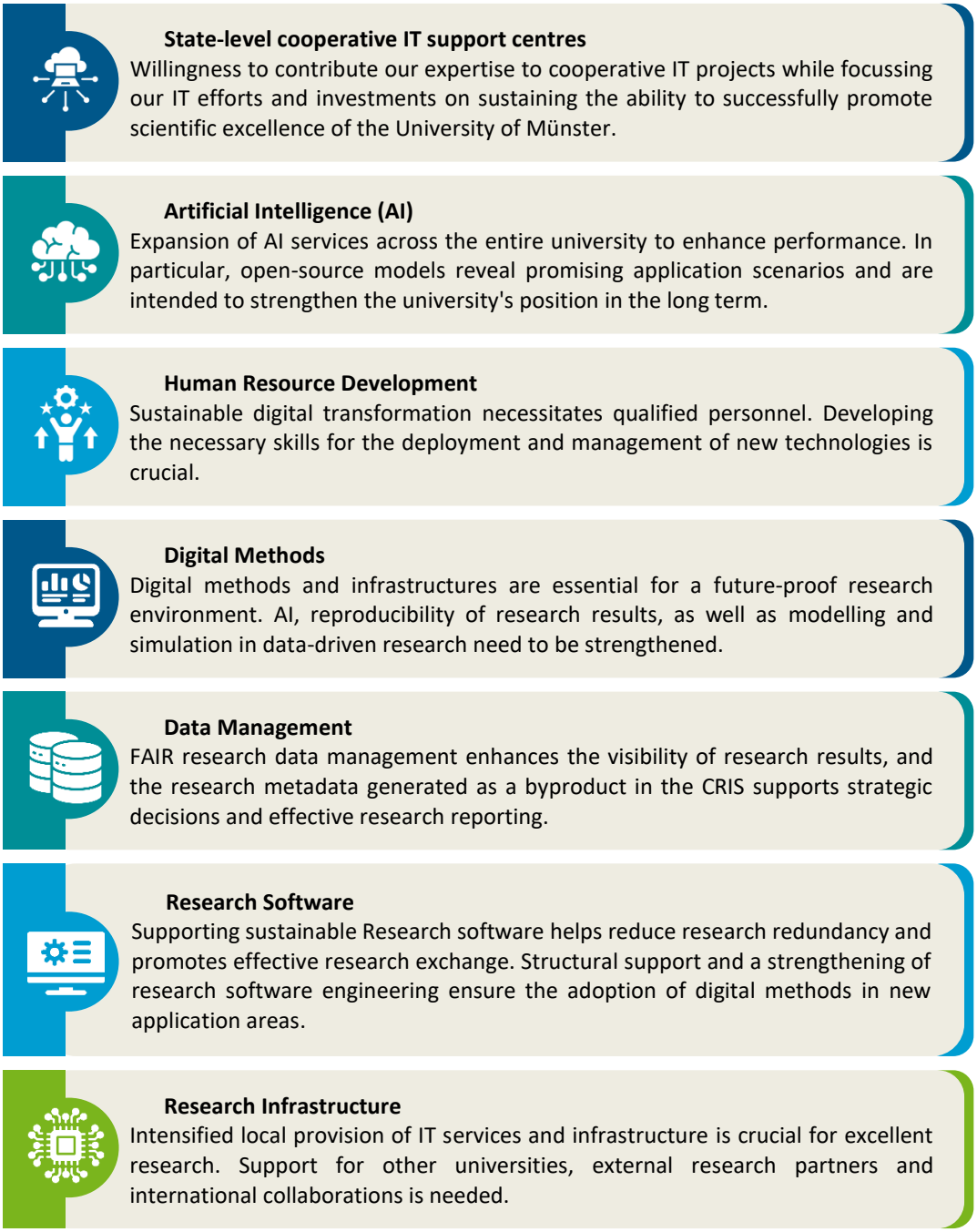
To achieve effective digital services, administrative processes need rethinking, involving collaboration from all stakeholders, while maintaining alignment with strategic goals. The governance structure at the university supports comprehensive analyses of strategic decisions and facilitates both complex IT projects and simpler administrative improvements.

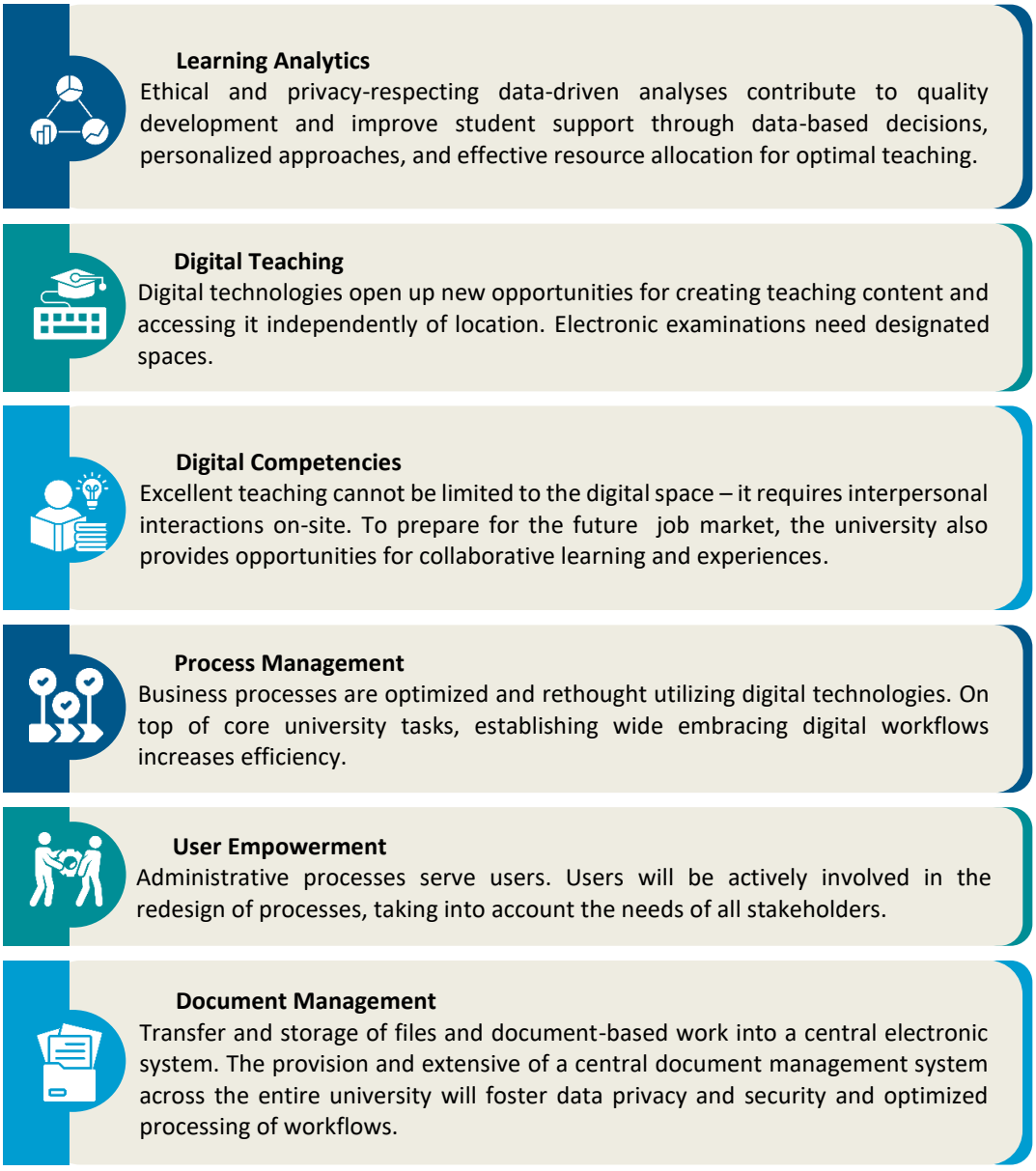
Communication methods have shifted due to digitalization, necessitating practical identity verification processes while maintaining necessary documentations in decision-making. Digital administrative processes serve to enhance the allocation of resources for research and teaching, providing tailored solutions that improve user experience and acceptance rates. The University of Münster emphasizes the accessibility and user-friendliness of its digital services to reduce the burden on users.

Finally, the establishment of effective document management systems is crucial for secure digital administration. The university is prepared to standardize the use of digital tools, ensuring consistency and promoting digital engagement among all users across the institution.

6 Summary and Conclusion

We have described the approach of the University of Münster towards creating a Digital Strategy – building on a revised IT governance system, stakeholders across the University a broadly involved and guiding principles for the Universities common understanding of Digital Transformation and the expectations into a Digital Strategy have been established. The stakeholder discussions in the course of the creation of the Digital Strategy have revealed four fields of tension, that need to be addressed to successfully execute the digital strategy – all strategic measures need to be assessed in view of these tensions and wide agreement and a balancing of interests has to be established. The final figure brings together the primary directions for measures in the pursuit of effectuating the Digital Strategy.


State-level cooperative IT support centres
Willingness to contribute our expertise to cooperative IT projects while focussing our IT efforts and investments on sustaining the ability to successfully promote scientific excellence of the University of Münster.
Artificial Intelligence (AI)
Expansion of AI services across the entire university to enhance performance. In particular, open-source models reveal promising application scenarios and are intended to strengthen the university's position in the long term.
Human Resource Development
Sustainable digital transformation necessitates qualified personnel. Developing the necessary skills for the deployment and management of new technologies is crucial.
Digital Methods
Digital methods and infrastructures are essential for a future-proof research environment. AI, reproducibility of research results, as well as modelling and simulation in data-driven research need to be strengthened.
Data Management
FAIR research data management enhances the visibility of research results, and the research metadata generated as a byproduct in the CRIS supports strategic decisions and effective research reporting.
Research Software
Supporting sustainable Research software helps reduce research redundancy and promotes effective research exchange. Structural support and a strengthening of research software engineering ensure the adoption of digital methods in new application areas.
Research Infrastructure
Intensified local provision of IT services and infrastructure is crucial for excellent research. Support for other universities, external research partners and international collaborations is needed.



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8 Author biographies

Raimund Vogl holds a Ph.D. in elementary particle physics from the University of Innsbruck (Austria). After completing his Ph.D. studies in 1995, he joined Innsbruck University Hospital as IT manager for medical image data solutions and moved on to be deputy head of IT. Since 2007 he has been director of the Centre for Information Technology (CIT) of the University of Münster (Germany). He is also the Chief Information Officer (CIO) of Münster University, a Professor of Information Systems (IS) and principal investigator (PI) in various research projects, including several Collaborative Research Centers (CRCs). He served as president of EUNIS for seven years and is currently president of DINI (the German Initiative for Network Information). His research interests focus on management of complex information systems and information infrastructures.

Christian Richter holds a Master of Science (M.Sc.) degree in Digital Work from the University of Chemnitz, which he completed in 2022. Prior to his graduation, he gained industry experience as a marketing manager for a European consumer electronics company based in Dresden, Germany, until 2022. Since then, he has been working as a coordinator for implementation of the E-Government Act and the Online Access Act at the Centre for Information Technology (CIT) of the University of Münster.