



STRATEGY

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IT Department within University Administration and IT Portfolio Steering Group

Strategy for KTH’s digitalisation during the period 2023–2027

This steering document has been agreed on by the President (ref. number V-2022-0710). The steering document applies from 1 December 2022 and until no later than 31 December 2027. The steering document governs what KTH should prioritise in relation to the digitalisation of its operations. Responsibility for review and questions regarding the steering document lies with the IT Department within University Administration and the IT Portfolio Steering Group.

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Introduction

In 2020, the board of KTH Royal Institute of Technology (KTH) adopted the *Digitalization Policy at KTH (V-2020-0402)*. This policy is in line with Sweden’s Digital Policy, which was adopted in 2017. KTH’s operations are broad, as they include education, research, collaboration and operational support. The principles in the adopted policy permeate these four areas, but the policy also provides guidance for collaboration with society as well as promoting skills development and providing a good environment for staff and students. The *Digitalization Policy at KTH (V-2020-0402)* makes it clear that digitalisation refers to operational development based on the opportunities offered by technology, in other words a digital transformation that enables us to do things in completely new ways, or to do completely new things. Increased digitalisation opens up a wide range of opportunities, including collaboration within and between educational institutions through digital meeting places and reduced travel.

The *Strategy for KTH’s digitalisation during the period 2023–2027*¹ consists of three elements: a vision, four strategic goals and conditions. Figure 1 shows the structure of the strategy.

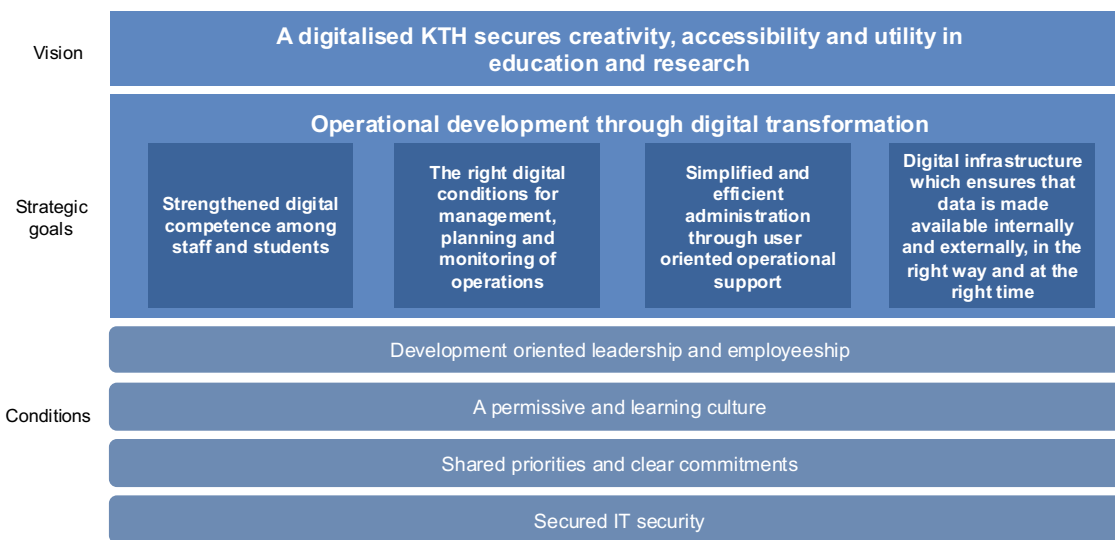


Figure 1: The structure of the strategy

¹ Hereinafter referred to as ‘the Digitalisation Strategy’.

1 Vision for a digitalised KTH

The vision for a digitalised KTH is as follows:

“A digitalised KTH secures creativity, accessibility and utility in education and research”

1.1 The meaning of the vision

A digitalised KTH highlights the University’s efforts during the coming years to ensure that digitalisation permeates education, research, collaboration and operational support, according to values based on democracy, the equal value of all people, fundamental freedoms and rights, and equality and diversity. KTH’s study and work environment shall be modern, effective and flexible.

A *digitalised* KTH emphasises that it is not just a question of a transformation from manual processes to digital processes, but of constantly ongoing and forward-looking improvement work in which operational development takes place in relation to digital technology. This shows the added value that digitalisation offers within various operations. It also involves the opportunity to collaborate and to exchange knowledge and information, both internally and externally.

The vision is based on the values *creativity, accessibility and utility*.

Creativity shows that KTH’s digitalisation shall contribute towards innovative thinking within the University’s various operational areas to ensure its leading role in education and research, and in its capacity as an actor within society. Among other things, digitalisation facilitates new ways of organising the operations in which both staff² and students have the opportunity to innovate and try new methods and ways of working.

Accessibility refers to the focus on making education and research accessible, both digitally and physically. Accessibility also opens up opportunities for the adaptation of education based on students’ various needs and requirements in order to assimilate education. Making education more accessible is in line with the *Framework for Future Education (V-2021-0870)*, which aims, among other things, to broaden the recruitment of students and to develop lifelong learning. Accessibility is also about enabling researchers – both nationally and internationally, as well as actors within industry and the public sector – to access research findings so that information and services can benefit everyone within society in an equitable way.

Benefit demonstrates that digitalisation is a means for operational development that leads to continuous improvements and value creation for staff, students and society’s various actors. Value creation is made possible, for example, through the utilisation of research-based knowledge in education, through the publication of research findings, and through research collaboration between educational institutions and businesses, authorities and the voluntary sector.

² ‘Staff’ means all employees at KTH as a university.

2 Strategic goals for a digitalised KTH

To clarify how KTH as a university will work to achieve this vision, a number of strategic goals have been established. Taken together, these strategic goals will realise the strategic shift that KTH will achieve over the next five years. The strategic goals have been established based on the following principles:

- The goals shall be in line with the *Digitalization Policy at KTH*³
- The goals shall provide guidance for *IT Portfolio Management*⁴
- The goals shall be in line with the development work on *The Framework for Future Education*⁵
- The goals shall be in line with the ongoing development work to form *an organisation for joint and coordinated operational support*⁶

The goals shall steer the development of action plans and operational plans for KTH’s various operations and the prioritisation of concrete initiatives.

The strategic goals are designed on two levels: *an overall level* which shows the strategic transition to be achieved, and *an underlying level* which shows subsidiary goals that specify priorities in concrete terms. Figure 2 shows the arrangement of the strategic goals and the subsidiary goals.

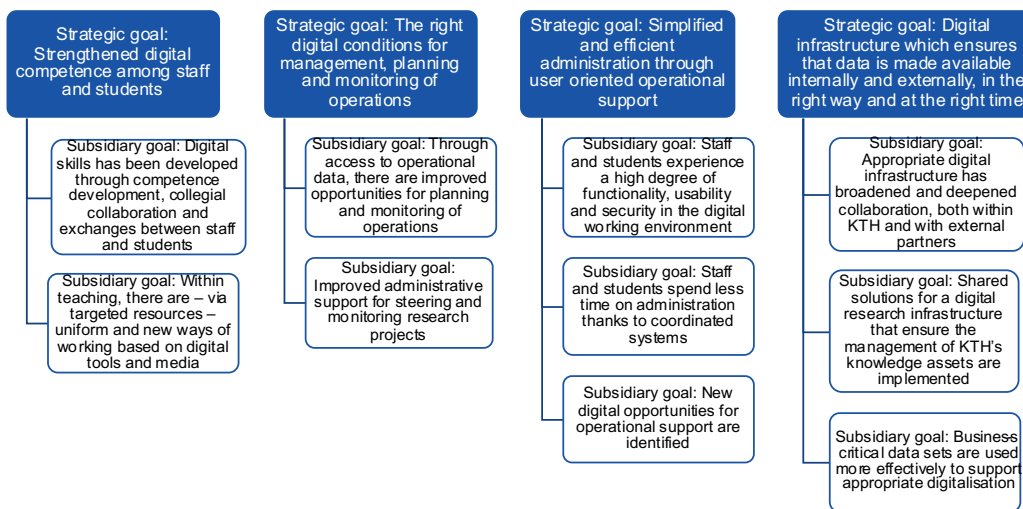


Figure 2: Strategic goals with related subsidiary goals.

³ Digitalization Policy at KTH, ref. number V-2020-0402 1.2

⁴ Decision on principles for the governance of KTH’s IT development and management, ref. number V-2021-0842 2.11

⁵ A Framework for Future Education at KTH, ref. number V2021-0870 2.2

⁶ Decision to task the University Director with establishing an organisation for joint and coordinated operational support for KTH, ref. number V-2022-0218 1.1

2.1 Strategic goal: Strengthened digital competence among staff and students

In order to develop KTH's operations towards creativity, accessibility and utility, digital skills is required. Both staff and students need to have the ability to keep up with digital developments and to understand how it is a condition for operational development. Everyone is part of KTH's development, and a greater understanding of the opportunities that digitalisation offers also contributes towards greater opportunities to participate in development work.

There are significant variations in the level and type of digital skills among staff and students. This affects how the various instruments of digitalisation can be integrated into the operation and content of research and education. It also has repercussions in terms of wide variations in the need for support of existing digital tools, as well as the opportunities for introducing new digital tools. In order for KTH to assume its role as one of Sweden's leading universities in offering and implementing digital education, joint efforts need to be made within all operations and conscious prioritisations need to be agreed on.

Digital skills consist of the extent to which staff and students are familiar with digital tools and services, and have the ability to keep up with the digital development and the impact it has on all our lives. Digital skills consist of general digital competence, non-technical skills and technical specialist competence. General digital competence enables staff and students at KTH to use new technologies in their day-to-day work. Non-technical skills include, for example, leadership for digital transformation. These competences also include communication and pedagogy, human-machine collaboration, critical thinking, creative thinking and ethics. Technical specialist competence is required in order to develop and implement new technology.⁷ Achieving this goal requires initiatives within education, research and operational support to strengthen the digital skills of staff and students. It also involves investing in lifelong learning, which will strengthen KTH's role as the leading university in terms of offering digital education.

2.1.1 Subsidiary goal: Digital skills has been developed through competence development, collegial collaboration and exchanges between staff and students

This subsidiary goal is motivated by the fact that there are significant variations in the level and type of digital skills among staff and students. Through competence development, exchanges of knowledge and collaboration, staff and students can learn from each other and individually. A more uniform level of digital skills within the organisation creates opportunities not only to ensure the usability of basic digital tools, but also to be a leading university that makes use of the opportunities offered by digitalisation. By extension, this gives students good conditions for developing appropriate digital skills. In order to realise this subsidiary goal, KTH – in its capacity as an employer – must earmark resources and free up staff time for skills development, and must offer opportunities for training.

2.1.2 Subsidiary goal: Within teaching, there are – via targeted resources – uniform and new ways of working based on digital tools and media

This subsidiary goal is based on the fact that KTH's staff and students are currently supported by various tools and media. Some of these are provided by KTH, while others are developed in-house to meet specific needs. Different digital tools are used to different degrees and in different ways within the schools, which complicates KTH's administration and support. Overall, there is a need to prioritise certain digital tools and to implement them within the organisation.

⁷ The Swedish Agency for Growth Policy Analysis. *Framtidens kompetensbehov för digital strukturovandling (Future skills requirements for digital structural changes)*. Östersund: The Swedish Agency for Growth Policy Analysis, 2020:2.

Targeted resources provide an opportunity to develop skills and new ways of working in connection with the selected digital tools.

2.2 Strategic goal: The right digital conditions for management, planning and monitoring of operations

KTH strives to achieve digitalised information flows that provide access to information and data in order to create the opportunity to work smarter, more securely and more efficiently. This allows for better management, planning and monitoring. This means that KTH can take advantage of the opportunities offered by digital technology, and thus reduce manual operations. The programme directive for joint and coordinated operational support describes how part of the goal of more efficient operational support involves considering on an ongoing basis what can be automated or digitalised using information technology. To strengthen quality work at KTH, there is also a need to acquire or develop existing systems.

2.2.1 Subsidiary goal: Through access to operational data, there are improved opportunities for planning and monitoring of operations

This subsidiary goal involves coordination of systems that makes operational data⁸ available, which in turn allows for planning and monitoring of operations. There are challenges involved in getting an overview of who is and has been employed at the University, as well as their academic degree, which complicates planning and monitoring in both short and long terms. By developing coordinated systems within administration, finance, education and research, better planning and monitoring are realised.

2.2.2 Subsidiary goal: Improved administrative support for steering and monitoring research projects

This subsidiary goal is based on the fact that research is conducted – and will be conducted – within an environment where funding comes from different funding bodies that place different demands on governance, monitoring and reporting back. This sometimes means that researchers spend a lot of time and resources on monitoring and reporting research funding. To enable researchers to spend time on the right things, improved support is needed in order to manage projects, plan, monitor on an ongoing basis and follow up on what the research funding is allocated for and how it is used.

2.3 Strategic goal: Simplified and efficient administration through user-oriented operational support

User-oriented and more cost-efficient operational support results in working methods that are smarter, more resource-effective and legally sound. This will benefit research, education and administration in connection with these operations. KTH's processes shall be developed to take advantage of the opportunities offered by digital technologies. This means changing the ways of carrying out certain administrative tasks that are currently based on analogue procedures, and reviewing system solutions that are not user-friendly. By achieving a more resource-effective working process, KTH can deliver the same level of quality at a lower cost.

Digital technologies has the potential to streamline and increase the quality of the processes within KTH's operations. Certain processes can be fully or partially automated. For other processes, digital development can result in simplified communication, exchanges of information, and improved opportunities for all staff to comply with public law regulations. It may also involve new ways of supporting or providing service to the operations. Teaching staff and researchers are given support and opportunities by KTH as an employer to independently

⁸ Here, 'operational data' refers to data that relates to the field of human resources and HR-related finances.

explore the opportunities of digitalisation in order to support and improve this work in their own education and research.

2.3.1 Subsidiary goal: Staff and students experience a high degree of functionality, usability and security in the digital working environment

This subsidiary goal is aimed at KTH creating the right conditions for digital security among users within the digital working environment and within digital society. As KTH's operations become increasingly data-driven, it is important to continue working to ensure that KTH's digital environment is secure against intrusion. KTH ensures that staff and students can be confident in the functionality and usability of the digital environment provided within education, within research and in contact with the surrounding world.

2.3.2 Subsidiary goal: Staff and students spend less time on administration thanks to coordinated systems

This subsidiary goal is based on the opportunities for a higher degree of coordination between systems. Through coordinated systems, KTH strives to ensure that staff and students only need to provide information digitally once. KTH will strive to ensure that contact with the University – from staff, existing or prospective students, and the public – is perceived as simple, smooth, seamless and legally sound. To achieve this subsidiary goal, KTH's digital infrastructure needs to be reviewed in order to identify and reduce activities that do not create value.

2.3.3 Subsidiary goal: New digital opportunities for operational support are identified

This subsidiary goal focuses on teachers and researchers using new, innovative IT support to carry out their operations. As needs change over time and as new solutions are developed, an ongoing review of the need for innovative IT support for education and research is required. Teachers and researchers should therefore be given support and opportunities by KTH as an employer to explore the possibilities of digitalisation independently within their own education and research, without compromising the individual's autonomy.

2.4 Strategic goal: Digital infrastructure which ensures that data is made available internally and externally, in the right way and at the right time

There is a lack of common operations and solutions at KTH for long-term management of research data. This has resulted in local investments in system solutions that are not used in a resource-effective manner, and where the lack of long-term management of locally generated data can lead to valuable data being lost. A more long-term, connected data infrastructure will create the opportunity to disseminate and access other researchers' data in a purposeful way. Against this background, and in view of developments within open science, there is a need for common digital services and it is important to be able to share and collaborate on data. This strategic goal is also motivated by the increasing availability of large quantities of data, as well as the technical opportunities for making use of this data. However, there is a lack of clear governance and management of data assets at KTH, leading to a fragmented data infrastructure for research, education and operational support, which in turn prevents good access to data within KTH.

2.4.1 Subsidiary goal: Appropriate digital infrastructure has broadened and deepened collaboration, both within KTH and with external partners

This subsidiary goal aims to ensure there is a digital infrastructure, such as broadband, data storage and IT security, that enables collaboration within KTH and with external partners. Sharing knowledge and data is a condition for creating better collaboration, both internally between the various operations and externally with the society. KTH shall strive for greater

openness to help create better collaboration between the public sector and industry, and thereby make smart use of society's resources.

2.4.2 Subsidiary goal: Shared solutions for a digital research infrastructure that ensure the management of KTH's knowledge assets are implemented

This subsidiary goal is based on the fact that there are a number of pilot initiatives and cross-functional collaborations that need to be scaled up and implemented on a broad front to have their full effect. The work to develop a shared solution for interconnected and interoperable⁹ digital research infrastructure means that KTH faces a number of choices regarding the strategic direction and funding model for managing, using and sharing research data. Investments in digital research infrastructure can improve the visibility of KTH's research achievements and create better conditions for KTH's research funding, projects and knowledge assets (publications, data, code, etc.) to make an impact on society.

2.4.3 Subsidiary goal: Business-critical data sets are used more effectively to support appropriate digitalisation

It is important for the future to facilitate both insight-driven¹⁰ operational support and data-driven research through KTH's strategic and mission-critical data sources being findable, accessible, interoperable and reusable. By linking up and developing the quality of KTH's data sources for mission-critical information, and by establishing and managing a number of master data sources for this mission-critical information, better conditions are created for information about KTH's operations to be used more appropriately. Through increased usability of business-critical data, both internally and externally, while taking privacy and security into account, the right basic conditions are created for developing more effective digital processes and appropriate digital operational support. Business-critical data sources relate to both data generated in research and education, and also other business-critical data that is needed for insight-driven decision-making support within the operations.

⁹ In other words, being able to exchange information seamlessly.

¹⁰ This means, for example, being able to base more and more decisions on facts and predictive analyses, and being able to use data to drive innovation and identify new business models.

3 Conditions

In order for KTH to be able to develop in the direction needed to achieve the strategic goals of the Digitalisation Strategy, the right conditions must be in place. A condition can be compared to an ability, and can involve competence, culture or technology.

Development-oriented leadership and employeeship: Achieving the goals set in this strategy requires both development-oriented leadership and employeeship. In development-oriented leadership, it is essential to support and create the right conditions for staff's learning and their ability to solve problems independently.¹¹ Staff are given the opportunity for individual learning at the same time that organisational learning takes place.

Since digitalisation is complex, cuts across a number of operations and is resource-intensive, leadership is required in order to initiate and advance digitalisation work and to ensure that the changed working methods have an impact. As a manager and a leader, it is important to be aware of and have competence regarding how your own operations can be digitalised or will be affected by the digitalisation of others. Managers and leaders are important for successful change, and leadership is about having knowledge of change management and the ability to support staff as they adapt. For staff, this means taking advantage of opportunities for learning and development within digitalisation.

A permissive and learning culture: In order to achieve the transition that the vision and strategic goals of the Digitalisation Strategy entail, a permissive and learning culture must permeate KTH's operations. Through skills transfer, staff and leaders develop and their commitment increases. This involves disseminating good practice between operations. This may involve our own experiences, as well as good examples from the surrounding world.

As well as learning from good examples, it also involves learning from those attempts at change that did not go according to plan. Ultimately, this provides an opportunity to adapt before the next attempt, and to do a little better next time. A permissive and learning culture supports staff's independent ability and desire to seek and share new knowledge, and is an important condition for creativity and innovation.

Shared priorities and clear commitments: In order to achieve the goals set in the strategy, they need to be concretised in action plans and operational plans. It is also important to ensure that development projects and digitalisation efforts are staffed with the right skills and to the right extent. Efforts in the form of time, resources and skills are important for appropriate change processes, and to achieve benefits and realise the agreed goals. Investments in digitalisation shall be made in accordance with KTH's sustainability and climate objectives and its Ethical Policy for gender equality, diversity and equal conditions.^{12,13} As digitalisation is an ongoing process, priorities and undertakings need to be continuously monitored in order to achieve the set goals.

Secured IT security: In order for staff and students to have confidence in KTH's digital transformation, it is important that the management and exchange of information takes place in a secure manner, and based on current legislation.¹⁴ Responsibilities and authorisations in

¹¹ Ellström, Per-Erik and Kock, Henrik. *Mot ett förändrat ledarskap? Om chefers arbete i team- och processorganiserad verksamhet (Towards changed leadership? On managers' work within operations organised in line with teams and processes)*. Lund: Studentlitteratur, 2009.

¹² KTH's University-Wide Sustainability Objectives 2021–2025 and Climate Objectives 2021–2045.

¹³ KTH's Ethical Policy.

¹⁴ SFS 2009:400. *The Swedish Public Access to Information and Secrecy Act*.

matters concerning IT security at KTH are governed by two policy documents: the Duties and Decision-Making Rights of the University Director,¹⁵ and the Rules of Procedure and Delegation Arrangements for Joint Operational Support.¹⁶

Information and IT security must be maintained and defended in all areas of operations. The digital systems and services offered must be perceived as secure and robust. Through structured information security work, everyone should be able to trust KTH's digital services, and be both willing and able to contribute to their use. Systems and working processes must protect personal privacy.

¹⁵ Delegation Arrangements: The Duties and Decision-Making Rights of the University Director V-2021-0483.

¹⁶ Rules of Procedure and Delegation Arrangements for Joint Operational Support V-2021-0484.