

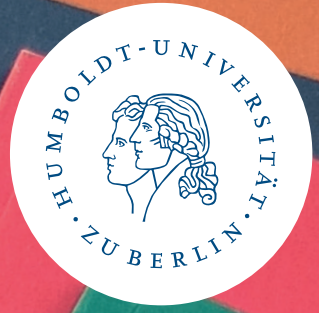


cms

2022 | 23

Review

Outlook



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Illustration: Photograph of all 9 CMS annual brochures published to date



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Editorial

Humboldt-Universität zu Berlin
Erwin Schrödinger-Zentrum

Year after year there are trends and further developments that present an academic computer and media service with new challenges, requiring rapid implementation if possible and simultaneously good planning. However, there have also been a few unforeseeable events, especially in recent years, that posed particular challenges to not just us at the CMS: The Covid pandemic has accelerated a digital transformation on many levels – including the associated data protection and security problems – and unforeseen supply chain issues, particularly in the IT sector. Last year, 2022, was the turning point that made it necessary, among other things, to save more energy in Germany, and not just because of the increased costs and global warming.

The CMS brochure 2022/23 is already the tenth edition in the new format. The scope has steadily increased from 32 pages in 2013 and has now reached around 76 pages.

The brochure has also become more diverse during this time. Since 2020, we have been developing a new topic-related dashboard – this year, topically, on saving energy. The content of the “Outlook for the year – projects” area has also grown considerably and is now an important building block for the presentation of upcoming activities in various areas. While there were 12 articles in the first issue, there are almost 40 in each of the latest issues – with very different scopes.

This year, we considered for a long time whether the brochure should continue to be produced in paper form or whether we should expand the two online formats, blog and PDF. In part due to this, we have created a survey (see QR code at the bottom of the page) to receive your opinion.

We are also very happy to receive any feedback on the brochure and on the individual topics. I hope you enjoy reading it.

Malte Dreyer

Director
Computer- und Medienservice



You can use the QR code on this page to let us know your preference for the format and any wishes in terms of content. You will help us a lot if you take the survey and give us a minute of your time.

D

Dashboard on Energy Consumption and Carbon Footprint in IT

How much does a search query cost on Google?

Google receives an average of 75,000 search queries per second. According to Google, one search query consumes about 0.0003 kWh, which is equivalent to about 0.9 metres driven in a small car.¹

The main factor responsible for CO₂ emissions is electricity consumption. This is not just about the electricity consumed by the private PC, smartphone, tablet or smart TV. It is about the entire infrastructure of the large digital companies such as Google and Facebook or streaming providers such as Netflix, Amazon or YouTube. In order to offer their services at all times, the companies have to keep gigantic data centres running.²

A laptop consumes 0.64 kWh in 8 hours at 80 W power.³ This corresponds to approx. 1921 metres driven in a small car.

A PC consumes 2.0 kWh in 8 hours at 250 W power.³ This corresponds to approx. 6,000 metres driven in a small car.

How damaging to the climate is digitalisation?

A study from 2014 calculated that the internet – if it were a state – would come in sixth place in terms of energy consumption, ranked only behind China, the USA, the EU, India and Japan. This is likely to have increased in recent years due to accelerated digitalisation, the trend towards cloud computing and ever new social networks.

All information and communication technology, whether personal devices or infrastructure, are now already responsible for two per cent of CO₂ emissions worldwide, on par with aviation fuel.

This is why critics ask: Is web surfing the new flying?¹

1 <https://www.verivox.de/strom/themen/stromverbrauch-google/>

2 <https://www.swrfernsehen.de/landesschau-rp/gutzuwissen/stromfresser-digitalisierung-100.html>

3 <https://strom-report.de/stromverbrauch/#stromverbrauch-1-person>

4 Articles for the year 2022 and methodology: <https://greenspector.com/en/videoconferencing-apps-2022/> <https://greenspector.com/en/videoconferencing-apps-2022/#methodologie>

5 <https://sedna.com/blog/the-carbon-footprint-of-carbon-copies-how-does-email-affect-the-environment/>

6 <https://www.umweltbundesamt.de/themen/co2-emissionen-pro-kilowattstunde-strom-steigen>

7 https://www.futura-sciences.com/de/wie-gross-co2-fussabdruck-e-mail_8484/

Saving electricity by switching off Wi-Fi at night

Out of 1,500 access points, approx. 1,125, i.e. 3/4 of all devices, are switched off at night. This results in a saving of at least 15,000 kWh per year.

With an average electricity consumption of 1,500 kWh per person per year³, this results in electricity savings equivalent to the electricity consumption of 10 people per year.



In the area of public computer workstations the following changes were made:

- All screensavers have been removed and the times for switching off the monitors have been reduced to 3 min (before: screensaver after 10 min, monitor off after 20 min).
- öCAP clients are no longer started automatically in the morning, but only when by the users.

Screensavers removed
Turning off of monitors:
reduced from 20 mins
to 3 mins



AGNES: By putting new hardware into operation and pushing all applications onto new server 8, old servers could be switched off.

Comparable CO₂ emissions from video conferencing and driving a small car⁴

- In 2022, the HU in Zoom spent approx. 137.88 million minutes in meetings.
- In this scenario with mobile phones, approx. as much CO₂ is emitted as would be by driving 34 times around the earth or 3 times to the moon.

1) with audio



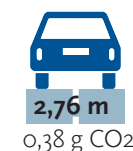
2) with audio and screen sharing



3) with camera



The CO₂ emissions of one minute of video conferencing on the mobile phone 1), 2), or 3) is roughly equivalent to those of a small car driving:⁴



2,76 m
0,38 g CO₂



4,82 m
0,67 g CO₂



9,82 m
1,37 g CO₂



An email at the HU generates an average of 0.5 g CO₂⁵, With approx. 50,000 mails delivered to the HU daily, this results in 28.5 kg CO₂.⁶

Activating the energy-saving options of the mail servers saves approx. 8.4 kg CO₂ per day since Nov. 2022.

Globally, email generates approximately 410 million tonnes of CO₂ per year. Global air traffic produced 918 million tonnes of CO₂ in 2018.⁷

How can you reduce the carbon footprint of your emails?

- reduce the size of attachments, e.g. by compressing images, or sending a hyperlink instead of a document
- unsubscribe from all unnecessary newsletters and subscriptions
- reduce the list of recipients to the bare minimum
- sort your mailbox regularly and delete all unnecessary messages
- limit yourself to using only one mail client at a time (e.g. do not use Thunderbird client on PC and smartphone at the same time)

23
22

■ ■ Annual review

January

01

ELSA: Coordination of the project structure for the pre-project for the introduction of a new campus management system.

Workshop on MetroRetro

Founding of the Video in Teaching working group:

The Video in Teaching working group is founded and deals with all the technical aspects of the use of video in teaching courses.

MoVe: Proof-of-Concept created with the participation of an external service provider.

February

02

Expansion of the SAP interfaces for identity management:

In the course of replacing the old systems with SAP, the interface for transferring the building and room data to HU-IAM was converted from FM@work to SAP RE-FX.

March

03

Foundation of the WG Services for the Administration

Founding of the HDL3 working group: With the founding of the HDL3 working group, the infrastructure for studying and teaching that was built up during the digital semesters is transferred to a permanent support of operation and further development and further development by several departments.

Foundation of the IT Security WG

OpenProject as a service: OpenProject is a powerful open-source project management solution. It is aimed at researchers at the HU and all other HU members who have to coordinate larger projects in a team. Those external to the HU can also participate in Open-Project..

April

04

Foundation of the Research Data/Info Services working group:

The WG serves the overarching exchange on the topics of research data, information and infrastructures at the CMS. To this end, staff from externally funded projects in which CMS is involved or in charge of come together with colleagues from the FDM initiative, for example, which manages various research data services for the HU.

Founding of the Service Management working group

Foundation of the HU Cloud working group

Foundation of the Project Management Office

Pentesting of applications:

Penetration tests (pentest(ing) for short) are intended to uncover and prevent security vulnerabilities in IT system.

FDNext Input Workshop

May

05

Coordination of a concept for data management plans at the HU

Introduction of the work area interfaces:

The work area records and documents interfaces of all IT applications supported by the CMS.

Integration of Amberscript for video subtitles:

Amberscript is integrated into Opencast as a new service for subtitling videos.

Starting signal for preliminary work on the employee ID card

Start of the conversion of the HU core network to fabric technology.

Introduction of SOGo v5:

The new SOGo version brings changes and improvements to the web interface. Nothing changes for users of Thunderbird, Outlook, Android and Apple devices and other calendar applications.

Kick-off workshop for the introduction of HISinOne

CMS Forum "Mobile Working"

June

06

Entry: Replacement of DFN-PKI-Global by GÈANT-TCS (Trusted Certificate Service):

Change of provider for digital user and SSL certificates. User certificates now available via self-service, SSL certificates via automated rollouts.

Replace new procedure for aliases:

Self-selected first names are now available for all users of HU accounts. In the interest of gender equality for inter*, trans* and non-binary persons, the Humboldt-Universität now introduces the ability to use a self-selected first name in HU systems.

Planning the expansion of server cabinets

Start of the QIO project Federal Identity Management

July

07

Founding member at the establishment of the Moodle Association with 28 other universities:

The Humboldt-Universität is one of 28 founding members of the Moodle an Hochschulen e.V. association. The association aims to act as a contact and multiplier for universities in German-speaking countries. Stefanie Berger was elected to the board.

Start of the project Network Hybrid Teaching:

The QIO joint project "Network Hybrid Teaching" of six Berlin universities starts its work.

First piloting of the MoVe concept with legal department**Conversion of the DFN Internet to BRAIN provider connection:**

The conversion to the provider connection of the Berliner Wissenschaftsnetzes (BRAIN) will continue to enable a redundant, fail-safe and broadband Internet connection of the Humboldt-Universität to the Deutsche Forschungsnetz (DFN) in the future.

Sourcing matrix for the CMS is available:

The distribution of tasks within the CMS and with external service providers is thus fully documented.

Start of the continuing education programme “CMS Update”**Electronic exams:**

The newly established testing centre in the Erwin-Schrödinger-Zentrum goes into operation with the first regular semester run for electronic face-to-face exams.

Access test for refugee students:

In August, Ukrainian pupils and students take their entrance examinations for their studies at Ukrainian universities abroad. The exams will be implemented in the BUA's e-Assessment Alliance, including in the test centre at the Erwin-Schrödinger-Zentrum.

First meeting of the Digital Teaching Strategy Group:

The Digital Teaching Strategy Group, convened by VPL as the successor to the Digital Teaching Task Force, meets for the first time.

Decision on the project for a “website relaunch” by the university management:

The overall project "website relaunch" is set up as a programme in two projects: In Project I “Piloting”, the preliminary investigation is carried out and the technical, design and conceptual basis is laid as well as the requirements specified in such a way that an overall architecture can be derived. In Project II, the infrastructure for the operation of the content management system will be put on a modern basis in parallel and extensions, interfaces will be provided and implemented, and the migration of the existing instances of the current system will be carried out. Project II also includes the development and implementation of the modified operating structures required for operation.

Patch management framework:

For a uniform understanding of the importance of patching IT systems, the patch management framework contains definitions of terms (e.g. regarding criticality) and time specifications for implementation.

Planning energy-saving measures**Establishment of a new update procedure for the ERPdesktop**

Start of the project to introduce the RDMO software for creating data management plans at the HU.

First version of the energy dashboard**Decision to replace Nagios CMS-wide with Zabbix****First stage of HPC@HU started:**

As a first step towards the introduction of high-performance computing services at HU (phase 1), capacities for a proof-of-concept are created.

Start of sub-project II “Rollout and operation” as part of the “Website relaunch” project.**Data protection concept for the project “Research Information Platform with VIVO” approved by all BUA partners.****Introduction of multi-factor authentication (MFA) for employees:**

With the launch of the Employee Self-Service ESS, two-factor authentication also went into productive operation at the HU. In addition to the portal for creating and managing the hardware and software tokens, the CMS-internal processes for issuing the tokens were also developed. Furthermore, a guarantee procedure was developed that helps to restore the ability to work in a timely manner if the token is lost.

Establishment of the work area Enterprise Application Management**Design concept for shared service catalogue available****Extension HU-IAM Output-Connector SAP for ESS:**

With the start of the contract at the HU, the SAP users for all employees are now automatically created and immediately provided with the authorisations for using the Employee Self-Service Portal (ESS). At the end of the contract, the SAP users are also automatically blocked again.

P

■ Annual outlook – projects

OpenIRIS – Online platform for discovering, sharing and booking research infrastructure

Scientific success is increasingly dependent on the timely availability of increasingly complex technologies and research services that not everyone can provide in their own institutes and laboratories. In addition, the innovation cycles of these technologies are becoming shorter and shorter and require adjustments to equipment and personnel.

In order to realise the best possible research environment in the BUA and to make the existing resources of all collaborative partners visible and usable, the management of all four houses (the so-called Board of Directors) decided to introduce the online platform OpenIRIS for the BUA.

Open IRIS is a non-commercial online platform designed to enable researchers to discover and share research resources. It serves as a collection of tools and best practices for resource management and its optimisation.

With the help of OpenIRIS, a common and visible platform is to be created for the BUA to transparently present and make usable existing core facilities, publicly funded large-scale facilities (e.g. applied for and funded via the DFG according to 91b GG) and research services. The portal will be a “single point of entry” and an interactive place where the researchers of the network can identify existing research infrastructures of all four institutions and submit requests for use. In some cases, direct booking of services is also planned.

OpenIRIS as a common platform can thus serve as the basis for joint strategic planning of new infrastructures or the expansion of existing ones.

If you would like to know more about OpenIRIS or if you are interested in using OpenIRIS, please contact: openiris@berlin-university-alliance.de.

HU: <https://hub.openiris.io>

BUA: <https://bua.openiris.io>

Federative identity management for teaching-learning scenarios

Inter-university cooperation in teaching and studies is becoming more and more important, whether they are alliances or bilateral study programmes. The basis for cooperative teaching-learning scenarios is comprehensive identity management.

With the support of the Berlin Senate (QIO funding line), HU, FU and UdK are working on a joint legal, technical and organizational framework for the state of Berlin and its network of higher education institutions until the end of 2024. Clarification of the legal framework is fundamental to enable the transfer of data from the respective teaching-learning systems in the first

place. At the technical level, coordinated standards must be developed. In part, there are already models in other federal states; in part, the requirements that have grown in the digital semesters as well as the specific cooperation scenarios in Berlin's science space must be taken into account.

The Berlin collaborative project will enable the state's universities to deepen their cooperation internally and externally and offer new services to teachers and students.

Data management planning simply and individually: The RDMO tool

Data management planning is now a mandatory part of a project proposal for many research funders. However, the requirements and formalities of the individual organizations and departments vary greatly. The CMS is currently introducing a tool for data management planning in order to easily and efficiently write precisely tailored texts for funding programmes such as those of the European Commission or the Deutsche Forschungsgemeinschaft. Many researchers had requested such a tool in last year's needs assessment (see p. 44, article by Denise Jäckel). The Research Data Management Organiser (RDMO) thus closes a gap in the CMS service portfolio and offers researchers an important added value: customised templates for research funders, departments and large-scale projects.

The open source software RDMO is already used at more than 45 institutions in Germany and is supported by a broad community. This means that updating and expanding the templates does not have to be done by the CMS alone, but can be done together with colleagues from all over Germany. More about RDMO: <https://rdmorganiser.github.io>

The HPC@HU initiative

High performance computing has become one of the base technologies of scientific research in the last decade. High Performance Computing (HPC) is currently not established at the HU as a central service, but in the form of distributed, separately used and supported installations at the chairs. At the same time, the demand for HPC is increasing in all disciplines. Compared to the national and regional HPC infrastructure, the low-threshold access is the most important criterion for local HPC offers. For this reason, a central HPC service is to be established at the HU in three phases.

At the beginning, a proof-of-concept is implemented, which can be used for balancing the concrete needs at the HU. In addition to the planning of the HPC components and the creation of personnel capacity, the expansion of the server rooms and the power and cooling supply are also important pre-conditions for this project.

The aim is to establish HPC services for the HU and to continuously expand them for all scientific areas. This should not only take into account classic HPC scenarios, but also create a low-threshold entry point for use by HU researchers who have not yet had any contact with HPC services.

Relaunch of the HU websites

Finally: The HU websites are undergoing a comprehensive relaunch. The project is divided into the sub-projects “piloting” (establishing the design-conceptual basis) and “rollout and operation” (modernising the infrastructure for operating the content management system).

The overall project is being managed by a steering group under the leadership of the Vice President for Studies and Teaching, see Fig. 1.

The Computer and Media Service is mainly responsible for sub-project II. As the central IT service provider, it is responsible for the up-to-date technical implementation of the new website. Represented by the technical project management, it accompanies the project through the different phases and develops a sustainable technology concept based on the needs identified in the project. In addition, it prepares an implementation and operating concept, taking security-relevant aspects into account. In cooperation with external service providers, it implements the connection of further systems.

Project phases of subproject II

1. conception of the architecture and provision of a new Web Content management system
2. transfer of the new layout into technical components
3. development of extensions and the sourcing structure
4. testing the migration of content from other systems
5. transfer of the new layout to other applications

The first tests on the suitability of TYPO3 with a modern headless interface are currently underway. An executable environment will not be available before July 2023.

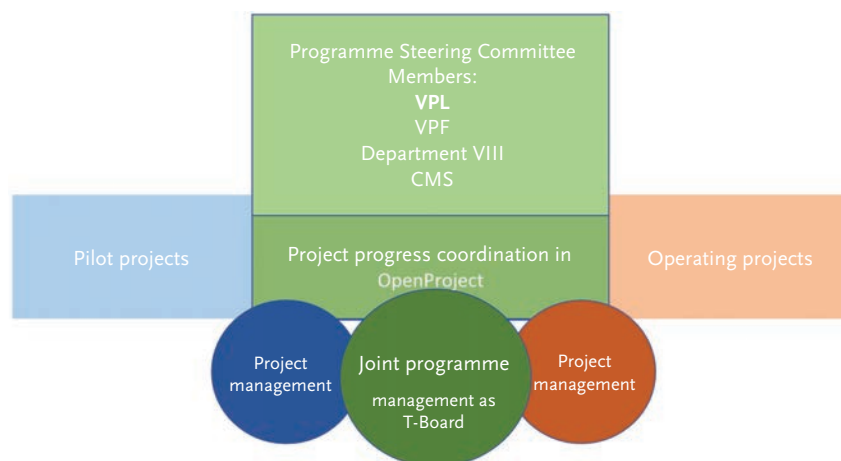


Fig. 1: Governance of the “Website Relaunch” programme

Machine learning for text-based classification of research information

As part of the project “Research Information Platform with VIVO” (FIP with VIVO), machine learning is used to automatically extract and classify research information from websites and research documents within the Berlin University Alliance (BUA).

Research information is metadata on projects, datasets, publications, research groups and more. Research information can be used to categorise these, facilitate the search process, improve the quality of search results and suggest further relevant results. Machine learning technologies make it possible to analyse texts on web pages or in documents and automatically extract, structure and classify research information. Natural Language Processing (NLP) is used for this purpose – a machine learning technology that provides algorithms for processing and analysing large amounts of language.

As part of the project “FIP with VIVO”, an approach is being developed to automatically extract and categorise research information from websites or research outputs. For this purpose, texts are automatically scanned and analysed by means of text extraction in order to extract entities such as names and organizations, specific information such as research foci and fields or predefined keywords.

Text classification enables automatic categorisation of extracted information under predefined tags or groupings. It also makes it possible to categorise texts via their context without predefined categories explicitly present in the text. A number of predefined categories are used for this purpose, e.g. disciplines, subject areas and interdisciplinary research fields. The entities of these categories are often arranged in so-called taxonomies, which can be converted into machine-understandable ontologies. This allows research information to be categorised and linked by disciplines and interdisciplinary research fields. This classification makes it easier to search relevant information and access research papers, for example within a discipline. It also provides important information for strategic research planning.

In future, this approach is to be supplemented by further classification methods, so that different filters enable even more precise search results and texts in German and English can be analysed.

The project “FIP with VIVO”, for which CMS is responsible, aims to develop a platform that presents information about researchers, research activities and outputs within BUA in a structured and searchable way. Current information on the project can be found on Twitter @vivo_bua and the project website.



From the organization

Hybrid working and flexible workplaces

Andreas Goroncy, Uwe Pirr

The pandemic has also permanently changed the work at the CMS: The rules for mobile working allow for a new flexibility and a better work-life balance. However, they also bring new challenges for social interaction and the availability of local offices and workplaces.

The possibilities of flexibilisation through mobile working are predominantly evaluated positively by the employees of the computer and media service and are gladly used. At the same time, the CMS has grown in recent years due to digitalisation and the associated expansion of services as well as participation in various projects. Workplaces and offices are becoming scarce and must therefore be used effectively. In this context, the possibilities of mobile working provide the required flexibility, but also bring organizational, technical and social challenges.

From a technical point of view, the workstations are equipped in such a way that the service laptops, which are now predominantly used, can be quickly connected to the existing infrastructure and peripheral devices such as mouse, keyboard, microphone, loudspeaker and camera can be easily used.

Video conferences, which have become an integral part of everyday working life, must be able to be carried out as smoothly as possible. This applies both to different individual conferences of several people in one room and to joint conferences of a group. Different approaches are used for this: Headsets, for example, ensure that people can listen and talk as undisturbed as possible. However, there should also be a room microphone in each office that enables joint participation in a video conference.

The flex offices are usually allocated on a team basis. This means that the communication channels are short and coordination takes place among each other. The possibilities and limits of digital booking systems are currently being explored.

The safekeeping of keyboards, mice and headsets, all of which are considered individual devices for hygienic reasons, must also be clarified. Furthermore, the workplace-bound telephone is an obstacle to flexibilisation. Telephone numbers must therefore be available on a personal basis wherever one works. There is also the question of how we want to communicate with each other in the CMS. In addition to the telephone and e-mails, chat services such as Matrix and video conferencing have proven to be fast ad hoc communication tools where colleagues can be called in spontaneously and things can be discussed and clarified quickly.

Cross-location collaboration on the CMS has become much easier and it doesn't matter so much in which office someone is located.

However, technical solutions cannot completely replace social contacts in working life. Quick agreements in hallway conversations can only be partially replaced by virtual coffee rounds. And regular all-hands meetings may convey the variety of tasks in the different work areas and make it easier for new colleagues to get to know each other, but they are not a complete substitute for face-to-face meetings in the workplace. As in most areas, flexible mobile working also depends on a balance and taking individual preferences into account, as the following statements by some colleagues show.

Statements from the staff:

"In the meantime, most people work hybrid and thus my workplace has also become more and more digital. I am very happy that mobile working is possible in addition to in-person days. This makes it possible to process many tasks and the flood of emails much more effectively, without interruptions and in a more concentrated manner." (Uta Feiler, secretary)

"I started at the CMS in my home office. Familiarising myself virtually with a new team and topic was a challenge. Today, I wouldn't want to miss the advantages of the home office. At the same time, I enjoy every opportunity to meet colleagues in person - that's why flexible workplaces are ideal for me." (Claudia Adam, Management and Communication)

"As part of the Graphics and Print team, I work on-site most of the time, because many tasks can only be done this way - such as providing print jobs, colour profiling or printer maintenance. This requires a fixed workplace as a contact point at our locations in Mitte and Adlershof." (Manuela Schulze, Team Leader, Graphics and Print)

"I made the decision to take the tram to work or walk again from the point of view of a clearer separation of work and private life and a bit more exercise. The possibility to switch to the home office at any time, e.g. to protect colleagues, facilitated this decision." (Mathias Roland, web mail databases)

"I mainly work from home. For work in the server room, I drive to the respective location if necessary. The compatibility of work and family increases enormously, especially for young families. In addition, the home office allows me to make better use of off-peak times for disruptive tasks, e.g. rebooting servers. Video conferencing has replaced the telephone for the most part, also in contact with users." (Malte Schmidt, HU-Cloud)



From the organization

What does the CMS Project Management Office do?

Thomas Krüger

From the organization

Report from the WGs

Andreas Goroncy, Dr. Maik Bierwirth, Interview Claudia Aera

The Project Management Office (PMO) is intended to provide an organizational umbrella for the many upcoming projects in the computer and media service, which arise both in the context of the digitalisation strategy and in the context of constantly changing framework conditions.

According to the definition of a PMO at company level, the PMO itself does not intervene in projects, i.e. it does not set them up, does not manage them and does not take responsibility for their content. The main task is both to look after the project management infrastructure (guidelines, templates and tools) and to support the project management in the corresponding processes.

This ensures that through the systemic view taken:

- all projects receive the necessary attention,
- no activities are lost,
- the entire project life cycle remains in view and
- bottlenecks, risks and problems in the course of the project are dealt with promptly.

This creates the basis for monitoring several projects in multi-project management. Components of the PMO are:

- Supervision of project ideas,
- support of project proposals,
- multi-project reporting,
- project review (steering committee),
- portfolio management.

Ten different working groups (WGs) at the CMS are dedicated to topics and pool expertise including the working groups WGs “Research Data/Info Services” and “Video in Teaching”. Three questions are posed to the two WG spokespersons Maik Bierwirth (MB) and Andreas Goroncy (AG), who report here by way of example.

What topics do the two WGs work on?

MB: In the “Research Data/Info Services” working group, we combine third-party funded projects on the topics of research data, information and infrastructures with permanent CMS services in these areas. For this purpose, projects in which the CMS is involved or in charge come together with the FDM initiative, for example, which manages various research data services for the HU.

AG: The topic of “Video in Teaching” extends at the CMS from the video service, media technology in the lecture hall, video management and streaming with OpenCast, and Moodle. In the WG, we try to map this entire information chain and are therefore dependent on the cooperation of many departments.

What are the WGs working on at the moment?

MB: We are jointly tackling challenges that arise in the projects, such as aspects of project management or networking, working on follow-up applications and implementing the project results in the CMS portfolio. We also develop initial approaches to a CMS third-party funding strategy that shows how the projects can contribute to the focal points of the CMS and the HU.

AG: We are designing concepts for room equipment to improve services. Currently, for example, we are discussing cameras with automatic tracking systems that focus on the person giving the lecture while he or she is moving. We see a lot of potential there to make lecture recording more dynamic with simple and automatable means and thus to achieve a significant leap in quality.

What longer-term strategies do the WGs develop?

MB: We are working on overarching strategies on how the CMS can work on its own ideas for the further development of services in projects and participate in the major research projects at the HU (e.g. SFBs) – and thus contribute to the university's profile in the long term.

AG: In addition to the introduction of new services, the aim is to consolidate existing services. We need to show what opportunities these offer and how we can also integrate them into the presence operation. We want to integrate the digitalisation boost of the pandemic into our service landscape and make it permanent.



From the organization

Enterprise Application Management (EAM) in the CMS

Alexandra Danilkina, Daniel Koschmieder, Torsten Eggert

From the organization

The “CMS Update” training format

Malte Dreyer

In the increasingly complex IT environments of the HU, it is necessary to adapt the strategic management of IT to these framework conditions. Especially in the central work area of ALFA 1, the applications, this can be better achieved by using Enterprise Application Management (EAM).

Increasing digitalisation not only brings with it a rapidly growing number of applications, but also a multitude of new connections between these applications. A current example of this is the connection of SAP to existing teaching and administration systems. For example, data on organizational units must be transferred from SAP via several systems such as AGNES (Teaching and Examination Online), learning space or identity management.

The introduction of Enterprise Application Management (EAM) will support the strategic management of the HU's IT landscape and make the growing complexity more manageable. EAM includes processes for designing the application landscape to move from the current application landscape to the target landscape. EAM controls and administers these processes and serves the coordination between IT and the business departments.

As a basis for the implementation of EAM, a mapping of all applications operated or connected by the CMS and their interfaces including data flows is necessary. Such a mapping should be accessible and comprehensible to many people, first in the CMS and later across the HU. In addition, a transparent overall view identifies new application contexts and enables the successful design of new application landscapes.

The future use of EAM must be supported by technical and organizational measures. A first measure was the establishment of a new work area “Interfaces” in the CMS Applications department. This work area is to take over the documentation of interfaces and expand this task into a dynamic process in the long term.

In addition, technological guidelines for the implementation of interfaces will be developed to assist with requests for new system links. As a technical measure, it will be examined whether the currently heterogeneous application landscape can benefit from the introduction of middleware. A central technical solution for data exchange brings direct advantages for the management of the interface and application landscape. As further steps, the processes around the management of the life cycle of applications are moving into focus.

The training format “CMS Update” offers CMS employees the acquisition and updating of methodological competences on various aspects of everyday work – from communication strategies to process management.

At the latest since the pandemic, the work situation for employees in the computer and media service has changed permanently. In addition to operational tasks, a large number of projects are regularly planned, managed and carried out. This results in changing tasks and roles in different constellations for all those involved.

The “CMS Update” aims to promote the further development of methodological competences and methodological awareness. For this purpose, a format was developed that enables regular participation in training courses even parallel to the regular workload. The CMS Update consists of online training sessions with new topics approximately every two months. Each topic is presented as a “lunchtime snack” in an introductory overview training session lasting 60 minutes. Participation is possible without registration. The training courses themselves take place on several dates online, each for three hours in the early afternoon to make it easier to integrate into the work routine. Each topic is followed by a joint review in an all-hands meeting with all CMS employees.

Topics of the trainings are, for example, “time and self-management”, “project management methods”, “communication strategies” or “process management”. Another special feature of the format is the joint development of the training content for the specific requirements of the CMS together with a service provider. This way we can ensure that the content is actually in line with our needs as well as existing knowledge and expectations. The experience with the new format so far shows a lively participation in the offers and the training topics are discussed more broadly in the CMS. Unlike individual trainings, which continue to take place, these joint formats have a stronger element of collaborative learning and collegial operational culture in CMS. For the further development of the format, it is already apparent that a further component is needed within the framework of the format, with which the methods learned can be applied more intensively in concrete workshops.

From the organization

The IT Board of the HU

Malte Dreyer

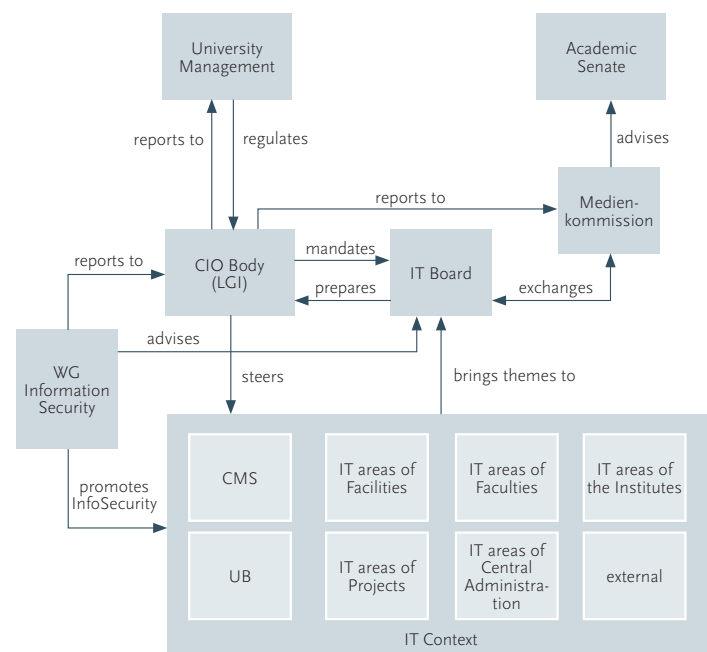
From the organization

Digital Sovereignty

Malte Dreyer

At the end of 2021, the IT Board of the HU was established as part of a newly organised governance. As a working committee of the CIO Board, it is to prepare topics and develop the basis for decisions by the CIO Board.

In 2022, the rules of procedure were adopted in four meetings and the first work assignments were tackled. The following figure shows the embedding of the IT Board in the governance structure of the HU.



The first topics were:

- Survey of the overall IT situation at the HU with staff, equipment, services.
- Which research data management services can be supported in the future?

Presentations from the central and decentralised areas as well as from external experts gave the IT Board an initial overview of the overall IT situation. For a quantitative classification, needs for further data were identified. In the area of research data management, better support for the creation of data management plans (DMP) was identified as a particular desideratum based on survey results at the HU.

Digital sovereignty here refers to the HU's abilities to independently control, effectively use and protect the use of its digital technologies and data.

Digital sovereignty (DS) issues have gained in influence in recent years in terms of data protection, information security, supply chains or licensing agreements. For example, examining where and how exactly one's personal data is processed when using applications is now an integral part of many people's choice of their own digital work tools. Universities also have to make decisions for their digital environments about how self-determined the digital infrastructure is, what dependencies exist and how these can be influenced. In the meantime, the federal government has set up ZenDiS (Zentrum für digitale Souveränität der Öffentlichen Verwaltung), which promotes alternatives for IT technology in public administration, and the "Sovereign Tech Fund", a format to support the development of open source technologies.

The existence of a broad field of providers for individual infrastructure, platform and application components is also an essential prerequisite for DS for higher education institutions, because where there are no alternatives, no self-determined decision is possible.

Higher education institutions use and operate a very wide range of digital solutions beyond the area of administration in research and teaching and use data from third parties. An overview of the sourcing structures of this digital landscape is therefore a first necessary step to determine the degree of DS. In recent years, for example, in the area of video conferencing, the establishment of European solutions and the development of open source software in this area have been promoted (such as BigBlueButton) and existing providers have improved their solutions (e.g. Zoom X – the new Zoom version for Germany).

In the field of Open Science, this transparency of service contexts within digital ecosystems is an essential prerequisite. This is because verifiability, reproducibility and re-use of research also require information on the framework conditions under which the results were achieved. Transparency can also help to respond to current crises. DS is therefore also an additional component of risk management and information security architecture. In addition to the existing open-source-first strategy, the computer and media service has analysed the sourcing structures of its own services. We are also developing measures to strengthen the DS, e.g. through service provider diversification or by building up know-how in cooperation with the service providers.



From the organization

IT Aspects in the “Circle-U.” Project

Yoan Vilain / Malte Dreyer

Circle U. is a higher education alliance funded by the European Commission. The Humboldt-Universität zu Berlin has joined forces here with eight other universities: Université Paris Cité, UCLouvain, Aarhus Universitet, Universitetet i Oslo, Univerzitet u Beogradu, King's College London, Università di Pisa and the Universität Wien.

These universities started working together two years ago to create a network for knowledge, education, research and innovation. The potential is enormous: about 475,000 students, 65,000 scientists, 34 associated non-university partners, about 700 Horizon Europe research programmes, numerous libraries and thus access to a huge amount of specialist literature.

The aim is to enable all members of the nine universities to participate in the attractive offers. Whether they are students, doctoral candidates, researchers or administrative staff, it should be made easy for everyone to move freely within this network and to benefit from it in order to jointly develop an inclusive European campus.

Thematically, Circle U. has written some currently urgent tasks on its agenda in Europe and globally. In research and teaching, a focus will be placed on climate change, global health and the current challenges for democracy. Formats such as summer schools, lecture series, digital teaching modules, staff weeks and exchange programmes will be offered to stimulate knowledge exchange within the Alliance.

Each of the partner institutions has a specific task. The HU has taken the lead for one of the so-called “Knowledge Hubs” with a focus on climate change – in other words, for a topic to which it has committed itself. The HU wants to become climate-neutral by 2030; that is, to significantly reduce energy consumption and greenhouse gas emissions. This is to be achieved through appropriate funding of research, through “green” teaching and “green” mobility, and also through sustainable policies in its own day-to-day business as an institution with more than 40,000 students and almost 6,000 employees. One of the driving forces behind this is the Sustainability Office, a student initiative that never tires of pursuing its vision of a sustainable university and is also active in Circle U. to this end.

With their commitment, the students want to make an active contribution to a sustainable society. Likewise, it is a declared goal of the Circle U. Alliance to have an impact on society at large. It is therefore constantly working on the question of how this can best be implemented: What can science contribute in research and teaching? And more generally: How can solutions for the major challenges of the 21st century be developed together with the interested public?

With such goals, effective science communication and interaction with other actors in civil society is also indispensable: visible events, cooperation with the arts and culture sector, generally understandable publications, attractive teaching and far-reaching exchange across national and European borders. Circle U. is therefore building on the further development of digitalisation in research and teaching.

The Computer and Media Service accompanies the digitalisation aspects of the association. It became clear early on that not only a platform on the web was needed, but a closely coordinated development of diverse interfaces. With such a broad-based consortium, questions of data protection quickly become complex, because some partners are not subject to the EU Data Protection Regulation, but must be included. It was also discussed how overarching architectures for a new common digital learning space or access to the existing local learning spaces can be implemented. Deeper technical integrations are part of the next project phases, which the CMS will continue to support in an advisory capacity. The project is breaking new ground in many fields: the standards necessary for European higher education institutions such as Circle U. are far from established, and for some problems there are no common approaches yet. Circle U. is thus part of a (further) development of standards for integrated digital organizations at European level, for which there is no precedent so far.

From the teaching

Subtitling services and accessibility in digital teaching

Andreas Goroncy

With VOSK and Amberscript, two services are available, with which course leaders can have their Opencast videos in Moodle automatically subtitle their Opencast videos in Moodle. Both services produce qualitatively different results.

The digital teaching of the pandemic period provided new challenges in terms of accessibility: Whereas in face-to-face teaching, digital tools were primarily sought for support, these tools were now put to the test in terms of accessibility through widespread use and new requirements arose. In the video conferencing tools, there was quickly so-called (multi-) pinning for sign language interpreters, functions for manual subtitling and different views and layouts. All this helped to create a more inclusive learning environment. There was also often a request for captioning capabilities of videos and lecture recordings. With Amberscript, an external and commercial provider, and VOSK, an open source solution hosted on CMS servers, two solutions are available for subtitling opencast videos in Moodle.

Amberscript ensures a high recognition rate. Only the audio file of the video is uploaded to their server, subtitled and deleted after one working day. In comparison, VOSK only provides average quality subtitles. It does not have any semantic recognition or distinctive punctuation and is to be replaced with more suitable software in the future. The desire to post-process the generated subtitles will also be one of the next expansion steps.

Much more complex than this type of subtitling is live subtitling in video conferences. In 2022, Zoom released this function for several languages. BigBlueButton is also in the process of implementing automatic subtitling. The particular challenge here is fast speech recognition. The CMS recommends using existing subtitling services by default and offering subtitles so that the functionalities are available to all who need them and do not have to be requested separately. Even subtitles with less than 100 % recognition rate can help to understand content and context, but they should always be able to be individually turned on and off. A fixed "burning in" of subtitles in videos can cause new problems and barriers.

Support digital teaching: digitale-lehre@hu-berlin.de
Subtitling of Opencast videos in Moodle: <https://hu.berlin/opencast>

From the teaching

The Digital Teaching Strategy Group

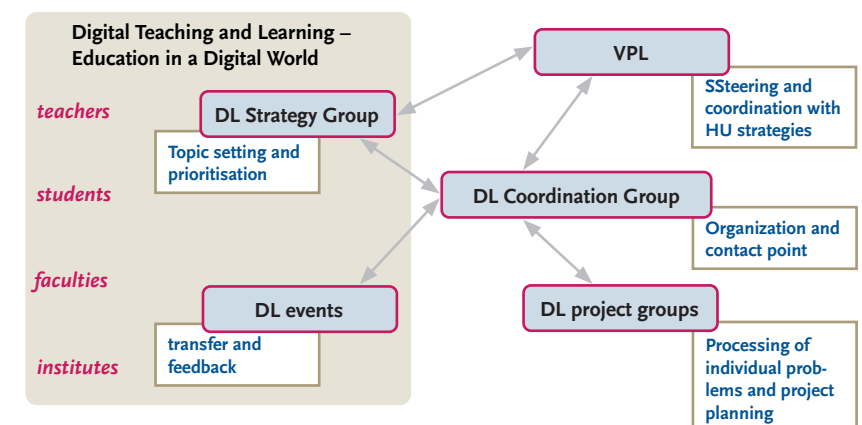
Uwe Pirr

The Strategy Circle Digital Teaching is the successor of the Task Task Force on Digital Teaching, which was founded by the university management at the beginning of the pandemic.

The Digital Teaching Strategy Group was founded by decision of the university management in summer 2022, and the task force was dissolved at the same time. The task force was primarily concerned with day-to-day business and a quick response to the demands of digital teaching in the initial period of the pandemic. The strategy circle Digital Teaching is intended to identify long-term needs and to plan and implement measures to meet these needs.

The first meeting of the strategy circle took place on 1.9.2022. The members are representatives of the teaching staff, representatives from the Kommission für Lehre und Studium (LSK) and the Medienkommission, representatives of the service institution UB, CMS and bologna.lab, the students, from projects in the area of teaching and the Vice President for Teaching (VPL). The Strategy Circle meets approximately four times a year.

It is supported by a Digital Teaching Coordination Group, which, among other things, prepares the meetings and coordinates the work of subsequent working groups. The coordination group also improves communication between the service institutions and the VPL area through a regular fortnightly exchange on the activities arising from the strategy group, but also on current topics of digital teaching. This in turn creates important impulses for the work of the strategy circle.





From the teaching

Centre for digital presence examinations at the Campus Adlershof

Công Pham, Stefanie Berger

Abb. 1: PC-Saal

The new Centre for Digital Examinations was opened for the first examination phase of the 2022 summer semester and offers lecturers the opportunity to conduct digital examinations on site. The rooms used for this purpose in the Erwin-Schrödinger-Zentrum serve as training rooms for courses and as a computer pool (PC room) during the lecture period. During the examination phase, they are available as examination rooms.

Background

The corona pandemic was the trigger for another important step in the digitalisation of teaching: conducting examinations on a digital examination platform. Digital exams offer advantages such as automated marking and location-independent processing. However, a disadvantage of conducting them as distance examinations is the limited possibility of supervision to prevent cheating. Even before the corona pandemic, digital exams were conducted at the Grimm Centre. However, the capacity at the university library is not sufficient to meet the university's needs. For this reason, it was decided to set up a temporary examination centre with 100 seats in the PC room and in the adjacent training rooms o'314 and o'315 of the Erwin-Schrödinger-Zentrum.



Fig. 1: Exam-style PC pool

Planning and implementation

The team for public computer workstations (öCAP) first replaced the computers in the Erwin-Schrödinger-Zentrum and in the two PC rooms in the Grimm-Zentrum with more modern all-in-one PCs with larger screens. In addition to new computers, privacy foils for the displays and privacy walls for the smaller pools were procured to make fraud attempts more difficult.

The Moodle team organised a booking and support procedure and provided a separate examination Moodle.

During the examination period, the passages between the PC room and the library area are closed and signposted with appropriate notices. Teachers and students are guided through the large glass door from the foyer into the PC hall and the training rooms by a responsible person from the CMS examination team, i.e. jackets and bags do not have to be locked away in advance.

Before the start of an exam, the link to the corresponding course is fed into the computer profile, so that after a restart of the computers, the students are led directly to the exam course after a successful login. Before the start of an exam, the link to the corresponding course is fed into the calculator profile, so that after a restart of the computers, the students are led directly to the exam course after a successful login. For this purpose, the computers were divided into the areas PC hall, PC pool on the left (o'315) and PC pool on the right (o'314), so that in the best-case scenario up to 3 exams can be carried out in parallel.

Commissioning

With the resumption of classroom operation, the new examination centre could be used for the first time by teachers and their students in the summer semester of 2022. For support cases before and during examinations, it is ensured that at least one CMS staff member is on site. Overall, the feedback was positive and future exam dates are already being booked well in advance.

From the teaching

Digital tools in pandemic change

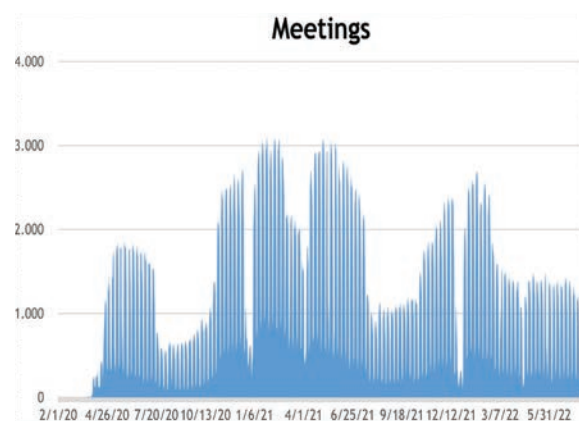
Andreas Goroncy

The introduction of the Digital Teaching and Learning Landscape HDL3 is accompanied by an important question: Is the solution only needed in the short term or will it also be needed in the future – and if so, to what extent? The usage statistics in the changing pandemic situation can provide an indication.

The CMS video conferencing service has been working on video conferencing scenarios for a long time. Whereas in the past they were primarily held in rooms equipped for this purpose, the challenge in recent years has been to connect the video conference rooms with participants on laptops and PCs.

Development of zoom use

With the introduction of HU-Zoom and BigBlueButton in the Corona pandemic, video conferencing became the standard solution for everyday communication. During the peaks at the beginning of the 2020/21 winter semester and the 2021 summer semester, there were sometimes 3,000 video conferences per day with up to 40,000 participants. With the lifting of most restrictions in the summer semester 2022, there was a change in usage behaviour with up to 1,500 video conferences per day and approximately 10,000 participants. In the first semesters, there was a staircase down in the statistics in each case – fewer meetings and fewer participants – the effect of the lecture hall emptying in the course of a semester was also reflected digitally. In the winter semester of 2021/22, however, there was an upwards climb: due to the increasing pandemic, there was a renewed focus on video conferencing and digital teaching during



the semester. In the summer semester of 2022, these increases ceased for the first time and the usage figures remained stable, so the usual effects of teaching were absent.

Fig. 1: The number of Zoom meetings per day over the course of the pandemic

This suggests that we are seeing figures here that map the use of video conferencing without any particular restrictions. Regulations for mobile working have come into force and many meetings have been successfully moved to the digital and have become established.

In teaching, it became apparent at the beginning of the winter semester 2022/23 that only in mass lectures and introductory events, where the degree of interactivity is lower, that video conferences are still a preferred solution. Hybrid settings have also become established for events and workshops, and participation via video conference is now expected as standard in certain settings.

Lecture recording

Lecture recordings also have a great benefit for students in hybrid teaching or face-to-face teaching. Lectures are easy to catch up on in the event of absence due to illness, care commitments or exam preparation, and with the subtitling services that have been introduced, they are also more accessible and can thus also support face-to-face teaching. With 22 calendar-controlled lecture recordings per week in the winter semester 2022/23, the service can still be significantly expanded, but new lecturers could be recruited so that the potential can be better exploited in the coming years. Also, so far only a few rooms are equipped with technology for calendar-controlled lecture recording.

The fact that teachers can delete a scheduled lecture recording in their Moodle course with just a few clicks, still surprises teachers today and illustrates the close integration of Moodle and the media technology in the lecture hall.

Other services

Other services of the teaching and learning platform, such as Overleaf, an online latex editor, or the messenger service Matrix have quickly found their use outside of the originally intended teaching and learning scenarios and have a steadily growing number of users. Here, too, the future will show what these services are used for.

CMS video conferencing service: <https://hu.berlin/videokonferenz>

Humboldt Digital Teaching and Learning Landscape HDL3: <https://hu.berlin/hdl3>

Opencast in Moodle: <https://hu.berlin/opencast>



From the teaching

Electronic examinations in presence at the HU

Claudia Aera, Andreas Vollmer

After returning to face-to-face teaching, a broad examination portfolio must be made possible – because even in face-to-face teaching, a wide variety of examination forms can be implemented digitally. In this interview, Andreas Vollmer from the CMS "Teaching Projects" team gives an insight into current developments in the area of e-assessment and shows perspectives for the future.

What topics are currently occupying the e-assessment area?

Together with the Media Commission of the Academic Senate, we are currently preparing a call for proposals on the key topic of "Designing Digital Examinations" for the "Digital Media" funding programme in the funding year starting in summer 2023. This aims to combine teaching, learning and examining into a triad. This not only raises the question of what examination means for teachers, but also for students. All participants should actively shape the examination culture. The question of how this examination culture can be implemented in hybrid forms is particularly exciting for us.

How has the examination culture at the HU developed after the return to pre-sessional operation?

In the digital semesters, well over two-thirds of all examinations at the HU were conducted using Moodle; in 2021, this was almost 90 % of all written examinations. After the return to face-to-face operation, the pendulum has swung in the other direction. This does not mean, however, that exams only mean pencil-and-paper exams – electronic exams are also possible in presence. In addition, more open forms are emerging, such as homework with different durations and assignments or other forms of examination, such as portfolio examinations, for which a portfolio is compiled. All these forms of examination can ultimately be handled via Moodle, digitally and in compliance with the law. The legal framework for this is now in place.

How are these legal framework conditions designed?

The Berlin Senate, with the active participation of our study department, has developed a basic statute, which the universities have implemented at their own institutions – at the HU in the form of an amendment to the "Interdisciplinary Statutes for the Regulation of Admission, Studies and Examinations (ZSP-HU)" with supplementary implementation regulations. This regulates how electronic examinations can also be used in the future in the normal

operation of the HU. This is a fundamental step – nevertheless, there are still obstacles in local examination regulations, for example with regard to permissible forms of examination. Obstacles, the need for adaptation and, last but not least, opportunities must now be systematically recognised.

In the E-Assessment Alliance, the Berlin University Alliance is driving forward the establishment of digital examinations in the network. What is there to report from the project?

In general, the focus has shifted from the "fire brigade operation" of the pandemic period back to a more strategic approach. With a view to the end of the project in 2025, the question is where we want to be then as a competence network with common and shared services. The perspectives are already becoming apparent: In the BUA network, we were able to jointly implement the large study skills test of HU psychology. The CMS temporarily provided a separate Moodle platform for this purpose, on which 1,000 prospective students were tested in parallel in two rounds – distributed across the FU, HU and TU with their respective different room concepts.

What is the room concept for electronic examinations at the HU?

Even before the pandemic, the CMS had begun to equip the PC pool in the Schrödinger-Zentrum so that electronic exams could be taken there at up to 100 seats. This service is available again in presence mode and is supervised by the CMS.

What developments do you see for the e-assessment business field in the future?

It's about supporting future forms of examination and their diversity. At the HU, we try to prepare as broad a portfolio of examination options as possible didactically, technically and legally, from which the appropriate examination can be selected – the CMS is actively involved in this. Therefore, we are dependent on the input of those who administer and take examinations. This feedback is to be obtained within the framework of the HU project "Prüfen 3D". The Media Commission's funding projects will also be included there. The CMS can then in turn bring this knowledge into the BUA network.

On infrastructure

Zabbix Dashboard: Energy

Daniel Rohde

Zabbix has been used for several years to monitor server systems at CMS. The energy crisis has awakened interest in the energy consumption of infrastructure systems, not only to find potential savings, but also to make the effectiveness of energy-saving measures visible.

Efforts

Due to framework agreements, the CMS mainly uses Dell products in the server environment. This makes the configuration effort for server systems easier to expand the existing Zabbix templates in such a way that the energy consumption can be queried, collected and aggregated. The recording of the consumption of network devices is more complex, since these devices do not always provide such values and, due to the long service life of these many generations are in use due to the long service life of these devices.



Fig. 1: Energy dashboard

Data sources

The energy consumption data can, for example, be read out directly from management interfaces of the units via the Simple Network Management Protocol (SNMP). Alternatively, the data can also be obtained from servers via the Intelligent Platform Management Interface (IPMI) or the Dell Open Manage software.

From the practice

The collected data can be displayed on Zabbix dashboards (Fig. 1), but they are neither reliable nor correct. Electricity meters in the server racks are certainly more accurate, but unfortunately not available. On the dashboard shown in Fig. 1, only just under half of the central servers are recorded. The graphs represent the hourly consumption, which is queried every minute, and only serve to recognise power consumption fluctuations over the usual daily and weekly courses. From this, measures to reduce consumption become visible.

Energy-saving measures in server operation

The following measures have been and are being discussed and implemented to save electricity:

- Moderate server equipment in terms of CPU core number/types, RAM, hard drive number and choice of hard disks (SSDs instead of hard disks)
- Activation of the energy-saving option in the BIOS of the servers
- Server virtualisation to reduce the number of server hardware
- Shutting down test systems and, in an emergency, redundant services and systems
- Switching off WLAN access points at night

Introduction of 2FA at the HU

Michail Bachmann

In the course of the introduction of the SAP service “Employee Self Service”, authentication with a second factor (2FA) is also being introduced at Humboldt-Universität zu Berlin.

To understand the background, a short digression on identification and authentication. With identification, you make a claim that you are a certain person; with authentication, you prove this claim. When logging in, you identify yourself to a system by entering something with which you can be uniquely recognised in the system, e.g. an account name, an email address or similar. However, since this entry can be made by anyone, this claim must then be proven. There are basically different possibilities (factors) for proof: through knowledge, possession, biometrics or (more rarely) securing the input/transmission. Proof by knowledge can be provided, for example, by entering a password (which must therefore not be shared). Proof by possession would be e.g. the entry of a once-usable code generated by a specially configured smartphone app or a hardware token. Biometric evidence would be, for example, fingerprints or facial features.

Authentication by a second factor (2FA) combines two factors for authentication. In most cases, the widespread factor knowledge (mostly passwords) is extended by factor possession or biometrics. It is important that different classes are used for 2FA; the use of two passwords (i.e. only knowledge) is not 2FA in this sense. With each additional factor required for authentication, it becomes more difficult to gain unauthorised access, so the security of a person's authentication is significantly increased. This is why 2FA is used in areas that require special protection. 2FA procedures do not serve to protect against misuse of an end device, but offer protection in the event that the password is compromised. If one's own password falls into the hands of others (through passwords stored in the browser, spying, phishing attack, ...), the second factor prevents the attacking person from gaining permanent access to services protected by 2FA.

At the Humboldt-Universität zu Berlin, the second factor is implemented using time-based one-time passwords (TOTP). These TOTP codes are numerical codes that are only valid for a short time and can only be used once. The procedure for generating them is standardised (RFC 6238) and there are various apps that can be installed free of charge on the smartphone or tablet, can be used without an internet connection or mobile network and generate such codes (so-called software tokens). The software token should be kept secure and separate from the actual work device (e.g. login on the PC,

second factor as an app on the protected smartphone). If this separation is not possible/desired, at least the access of third parties to the work device should be limited (do not keep the second factor on shared/public PCs, lock the screen when leaving the workplace, set up password protection for the OTP application,...).

Alternatively, the codes can be generated using a hardware token. However, software tokens are ecologically and economically more sustainable than hardware tokens. This is because they are subject to a physical life cycle, i.e. they have to be ordered, delivered, distributed and received again and disposed of. Hardware tokens contain batteries that only have a limited lifespan. In short: with hardware tokens there is a considerable additional expense that does not arise with software tokens. Therefore, software tokens are preferable from both an ecological sustainability and an economic point of view. The HU therefore recommends that all employees use software tokens. However, since not all employees want to use or own a private device for official purposes, the HU also provides hardware tokens.

The generation of one's own software tokens and the registration of the hardware tokens received is done via the newly established 2FA portal (short link: <https://hu.berlin/2FA>). There you will also find instructions (text and video) on how to set up the token. After the token has been set up, the OTP is requested for individual services via the web-based SingleSignOn system Shibboleth. Service operators who integrate an OTP query in their service, please contact the Shibboleth team (short link: <http://hu.berlin/sso>).

Authentication or authentication?

While authentication describes the presentation of a proof of identification (users authenticate themselves to a system by means of unique logon information), authentication means the verification of this proof of identification (the system checks the validity, it authenticates the users).

On infrastructure

Further development in the HU Backbone

Jens-Uwe Winks

Since 2009, the HU Backbone has operated on the basis of MPLS routers. The technology used so far is complex, cost-intensive and outdated. It needs to be replaced. Various approaches were evaluated for this purpose. In the end, the decision was made in favour of fabric routing.

Objective

The realignment of the HU Backbone aimed to retain the advantages of MPLS technology while eliminating its disadvantages. Fabric technology was chosen, specifically the Ethernet Fabric from Extreme Networks. It meets the requirements, allows higher speeds and offers advantages in terms of scalability, performance, redundancy and management. In addition, the port, procurement and maintenance costs are significantly lower compared to MPLS technology.

Functionality

The term “fabric” refers to an interconnection of network nodes (switches) in a topology in which several paths are used for load distribution (multi-pathing). A fabric separates the physical infrastructure (switches, connections/ links) from services that are used on this infrastructure. Services (referred to as VSNs in the fabric context) are layer 2 (VLANs) and layer 3 services (routing) according to the OSI model. These are virtualised in a fabric with low complexity and very good scalability. The special feature of the Ethernet fabric is that no IP network is required as an underlying layer to form the fabric. Its structure is based on established protocols with some extensions and is relatively simple overall. Automated commissioning of fabric nodes (zero touch fabric) is possible. The architecture of the Ethernet fabric can consist of rings, meshes, the spine-leaf model or a combination of these forms. Furthermore, the fabric allows for improvements in geo-, layer 2 and layer 3 redundancy through SMLT and DVR, which avoids awkward pathways and allows for both east-west and north-south traffic in the network.

Structure and migration

The core network of the fabric is formed by four VSP7400 switches. These will be installed at the locations Rudower Chaussee 25 and 26 (ESZ), Unter den Linden 6 and Planckstr. 14 (GZ). Each VSP7400 will receive two 100 G connections as well as additional low-speed connections to its neighbouring core switches. Ultimately, each fabric switch will have alternative paths.

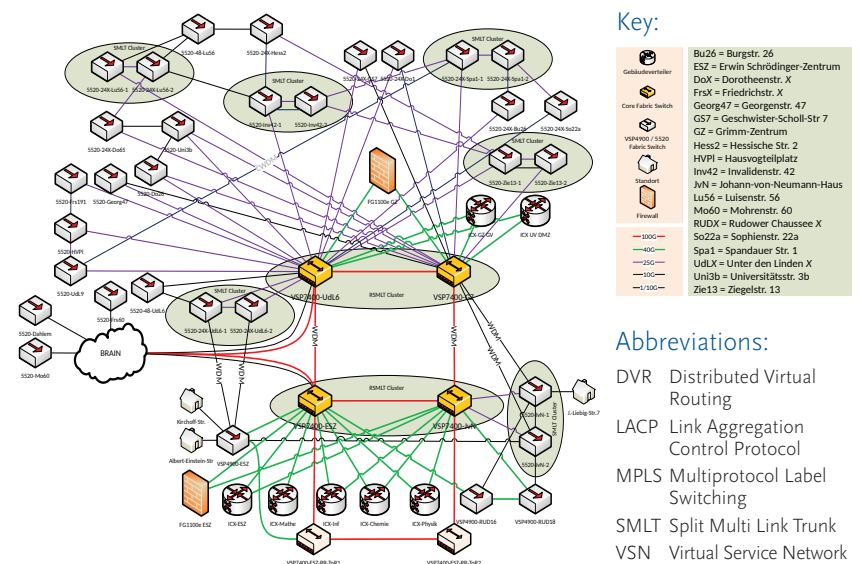


Fig. 1: Backbone operation Ethernet Fabric – expansion 2024

The speeds of the fabric switches on the uplinks vary between 10, 25, 40 and 100 GBit/s.

MPLS and fabric core are operated in parallel for a transitional period. After the installation of the fabric core network, the connections of the MPLS Backbone (Layer-2 & -3) and the central firewalls take place. The routing is gradually taken over by the fabric. The switches that operate as building distributors in Adlershof will be switched to fabric nodes. At the same time, proprietary redundancy protocols are being replaced and a distributed redundant connection is being established on the basis of LACP. Subsequently, the two MPLS routers at the Adlershof site will be switched off. Further MPLS routers in Mitte will be successively replaced. If necessary, MPLS traffic will be routed through the fabric to maintain the redundancy of MPLS nodes.

In the first expansion stage, about 40 fabric switches are planned for the operation of the Backbone. The fabric is scheduled to go into operation in the first quarter of 2023 and is expected to completely replace MPLS by mid-2024.

On infrastructure

JupyterHub – Using software in the browser

Malte Dreyer, Michael Wuttke, in Kooperation mit ChatGPT (Jan 30 2023 Version)

JupyterHub is an open source tool that allows students, teachers and researchers to use interactive Jupyter notebooks in the powerful HU environment without further installations for prototyping, data analysis and visualisation in the browser.

JupyterHub is a platform that makes it possible to run Jupyter Notebooks. A Jupyter Notebook is a kind of interactive diary where code, text, images and other media can be compiled. As in a classical development environment, this allows data analysis or prototyping of applications. JupyterHub provides a comprehensive range of tools for analysis and programming that are easily accessible for students and teachers. A JupyterHub also offers advantages for research, because interactive notebooks can be created that document all steps of an analysis. Centralised provision also means that larger and more flexible computing capacities are available, such as GPGPUs¹ for machine learning tasks.

Using JupyterHub requires some initial training. However, the advantages of a uniform platform for many usage scenarios saves time after a short period of familiarisation in comparison to the maintenance of versions and work statuses on different systems, or even in the case of distributed data storage. Students can also enable their fellow students to understand and comment on the results of their analyses. The shared resources can be accessed from anywhere. JupyterHub also offers several advantages for teachers. Materials and interactive notebooks can be made available and shared, commented on and reviewed more easily.

In addition, research data can also be stored, shared and analysed via JupyterHub. This enables interactive data analysis and visualisation and processing of data in real time. The workflows and methods can also be documented in the process. JupyterHub also integrates HPC resources to provide uncomplicated access to more powerful computing capacities, such as for machine learning. The basis for a JupyterHub are Jupyter Notebooks or Jupyter Labs, in which runtime environments, so-called kernels, are brought together in a web interface. A large number of kernels are available, such as Python, Spark, R, Tensorflow, Keras or PyTorch.

How does the JupyterHub work from the user's point of view? In principle, JupyterHub works like a normal web application. After logging in to the JupyterHub homepage in the browser, the available notebooks can be opened or a new notebook can be created.

HU's JupyterHub is being built by the CMS. The plan for this year is to make the first functions available to a wider circle of users. To this end, an Openstack environment with over 3,000 virtual CPU cores, 12 GPU A100 cores and more than 13 TB of RAM is currently being commissioned. A first test environment for JupyterHub, which was created as part of the AI-SKILLS project and runs within a Kubernetes cluster, has existed since the winter semester 22/23 and can already be tested. You can reach this page – from the HU network or via VPN – via the following URL: <https://jupyterhub.cms.hu-berlin.de>. The registration takes place by means of an HU account. After logging in, you currently have the option to choose between six different Jupyter Labs with different equipment.

For questions about JupyterHub, please contact michael.wuttke@hu-berlin.de

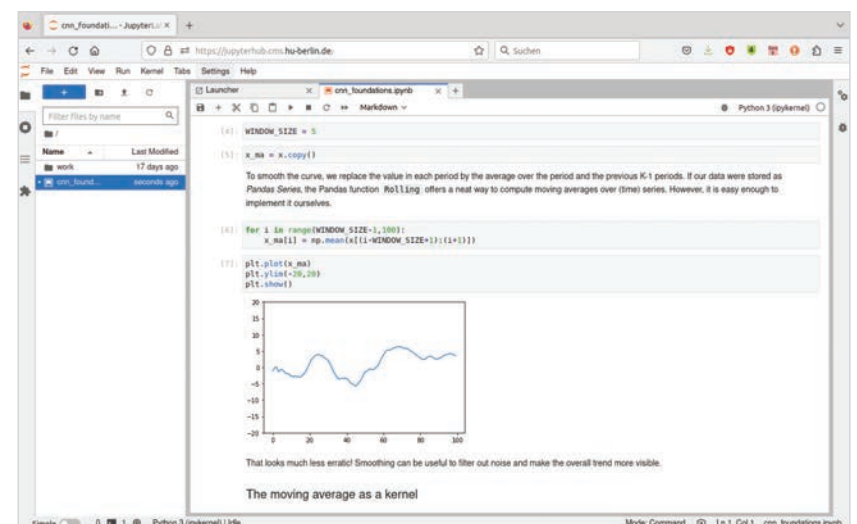


Fig. 1: Excerpt from the demonstrator

- 1 GPGPUs – General Purpose Computation on Graphics Processing Units. They are used for calculations using graphics processors.
- 2 <https://www.projekte.hu-berlin.de/de/ai-skills>

On infrastructure

Shibboleth SSO – a gateway to Central Identity Management

Michail Bachmann, Petra Berg, Ingo Rauschenberg

On infrastructure

The Politics of Names

Prof. Dr. Beate Binder

Today, most applications and application systems are accessible via the web and contain sensitive data that must be protected from unauthorised access. In order to recognise authorised persons beyond doubt – to authenticate them – the standard SAML, Security Assertion Markup Language, was developed, for which Shibboleth is an implementation.

The principle behind this is that the web application delegates authentication to another service – the identity provider (IdP) – which has previously been classified as trustworthy. In addition to pure authentication, further data can be transmitted to the authenticated person.

The prerequisite is a mutual position of trust, which is established through the exchange of so-called metadata. This can be done directly between IdP and the application (service provider, SP), or by means of a federation that combines several SPs and IdPs.

The Shibboleth login method offers two major advantages. On the one hand, the web application does not have access to the user's password at any time after logout, and on the other hand, the web application always receives current data on the logged-in person from the IdP at the time of logon and thus does not need its own user administration. If resource management at user level is nevertheless necessary, the person can be recognised on the basis of identifying attributes, and the data stored locally in the application with data transmitted by the IdP, if necessary. (e.g. in the case of name changes).

The IdP of the HU is directly linked to the central IdM (HU-IAM) and thus has up-to-date account and personal data. A practical example: A web service of the HU (e.g. AGNES) stores personal data locally, as this is also required by the application after logout. By logging in via Shibboleth, the web service also receives current data such as first name, last name, etc., if users agree, and can update the locally stored data. In this way, users no longer have to change their name with the web service, as it is simply updated by the transferred data the next time the person logs in.

You can find more information on the HU's Shibboleth website: hu.berlin/SSO

Every child is given a name at birth. This absolute right is part of the guardians' responsibility for care. What sounds quite simple at first, turns out on closer inspection to be quite difficult.

While the assignment of a surname is primarily a matter of fulfilling legal regulations, first names are a matter of agony of choice. Here those responsible for the child's care are challenged to find the “right” name. It is only almost a free choice, as it is subject to regulations. In addition, collective systems of meaning come into play, connotations and ideas associated with names. Whereas in the past names were often used to make the genealogical affiliation visible, which is why names of godparents, grandparents or parents-in-law were passed on, today the desire to mark the individuality of the child seems to dominate. The annual announcement of the most popular names speaks of this change and shows the interplay of individual decision and collective ideas. Whereas there used to be clear winners, at least regionally, the top 10 today conceal rather small numbers of cases – not least because mobility and migration have significantly expanded the repertoire of names. Nevertheless, there are also “perennial favourites”: Anna and Karl – the hits of 1890 – are very likely to be called Mia and Noah, but both names are still popular today. [1]

Names convey a variety of information. Central is the reference to the gender of the bearer. The German law on names even prescribes a certain unambiguity here, and in fact only a few names lack any gender connotation. In recent years, this has become a political issue. A large number of people no longer want to submit to the constraints of the binary gender order, since the assignment of a gender is always accompanied by expectations about appearance, behaviour, character traits, etc. Because gender is also conveyed through names, trans* and non-binary people try out new names that better correspond to their gender (non-)affiliation. An official change of name is still difficult under German law. But invoking the name assigned at birth is a hurtful experience. In this respect, it is welcome progress that names can now be changed more easily in the university registration systems. Every person deserves the right to be recognised in his or her individuality at the university.

¹ Popular (and rare) first names. <https://www.beliebte-vornamen.de/>. 28.11.2022.

On infrastructure

Service list, shared services catalogue and Jira – a comparison

Jenny Schmiedel, Dr. Andreas Kunert, Sabine Neumann

Our university offers a wide range of services that enable and support research, administration and teaching. It is not only essential for users such as researchers, administrative staff and teachers to be able to find the services easily. An inventory of the services is also necessary for an internal overview. There are various services in the CMS – in development and in the inventory.

List of services

All IT services of the CMS as well as all related relevant properties are stored in a central database with the profane name “service list”. The information in this database can be accessed via defined interfaces – for example, it forms the basis for the A – Z list of all services on the CMS website. The service finder, a list of all CMS services in question based on user-defined filter criteria (including target group selection), is also based on the service list. Last but not least, the printed overview of CMS services that appears elsewhere in this brochure was generated with the help of the service list database.

Jira

IT service management is about organising workflows for the delivery and continuous improvement of IT services. It is not only about processes, but also about the technologies and information that form the basis for them. It is all about the interaction of partners and service providers, about the people in their institution with their own strategic orientation and also about the structuring of the organization. In order to better support these above-mentioned measures in their interaction, the introduction of a tool for integrated service management began in 2021: Jira Service Management and Confluence.

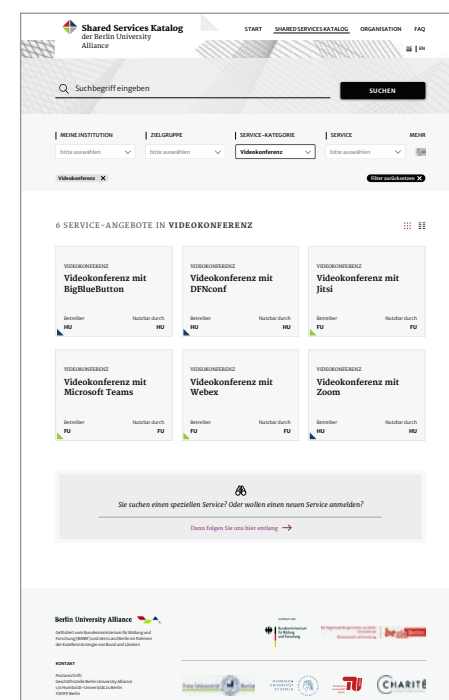
Jira Service Management combines a user portal with a ticket system, a freely configurable asset database and workflow modelling. Confluence, which is integrated with Jira Service Management, is a tool for creating, storing and finding information and can be used for knowledge management for teams and projects.

In the portal, users can find information about the IT services offered, make requests and view the processing status. They can also give feedback, report faults and find out about known faults. The users' reports are processed by CMS teams in the underlying ticket system. Requests can be easily shared with the teams involved.

Shared Services Catalogue

The Shared Services Catalogue is a pilot project for the Berlin University Alliance. For the time being, all IT services of Humboldt University and Freie Universität are being catalogued in a demonstrator. What is special is that some IT services can also be used across institutions. Through filter functions, users can display all IT services that can be used with which can be used with their own university affiliation - i.e. those of their own institution and shared IT services of other institutions. In the planned further development, the IT services of the Charité and the Technische University of Berlin will also be included.

The Berlin universities and the Charité are joining forces in this project to offer their staff ideal conditions for research and teaching. Berlin-wide desiderata in infrastructure can be identified more quickly with the help of a catalogue and joint investments can be better managed. IT service offerings should not only become more visible, but their strengths and limitations should also be made comparable.



“He who seeks often finds more than he went to seek.”

Molière's statement also applies to Humboldt University's IT services. None of the offerings is a mere list of links. As the service offers are managed and inventoried with Jira, the service catalogue of the Berlin University Alliance expands the offers beyond the HU and should also provide booking and editing functions in the future.

Fig. 1: Extract from the demonstrator

Research data

BUA-FDM Project: Results of the Needs Assessment

Dr. Denise Jäckel

The joint project “Concept Development for Collaborative Research Data Management Services” of the Berlin University Alliance is developing joint concepts and services for sustainable competence building in the field of research data management (FDM) in order to avoid parallel developments and to enable synergy effects.

A central basis for this is an online survey carried out at Verbund from 02.12.2021 to 07.01.2022. The institution-specific part here contains 25 questions, none of which were obligatory. At the Humboldt University of Berlin 354 researchers took part, 153 of whom stated their status voluntarily. Their responses show that research data is published for data security, reproducibility or reproducibility or verification of results, as long as there are no legal aspects or lack of resources to prevent this.

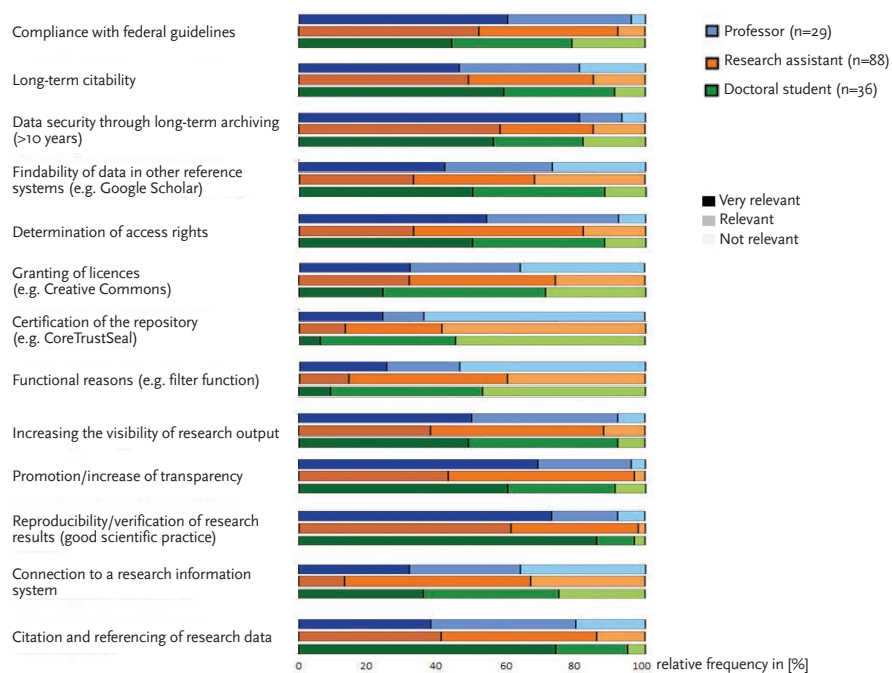


Fig. 1: Relevances (from left: very relevant – relevant – not relevant) for data publications by status group in 2021 at Humboldt-Universität zu Berlin. The percentage values of each status group were used for each answer option.

Technical tools are lacking for the creation of data management plans (DMPs) and data organization and documentation. DMPs are often not created due to lack of time, resources and knowledge. Documentation is often done according to the company's own or the group's own specifications or according to subject-specific standards.

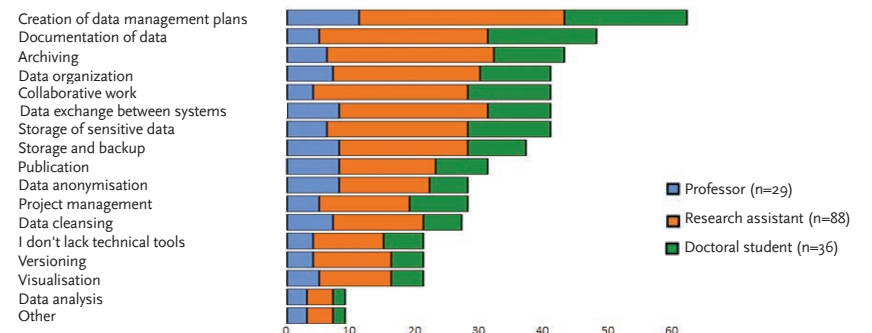


Fig. 2: Missing technical tools by status group in 2021 at Humboldt-Universität zu Berlin. The absolute numbers for the individual status groups are given.

The most frequently requested advisory services are workshops, training and courses as well as a web portal on the topics of DMPs, legal issues, storage, backup and archiving. The greatest help and incentives for better FDM would come from better staff resources, standards or guidelines and by promoting the visibility of data publications.

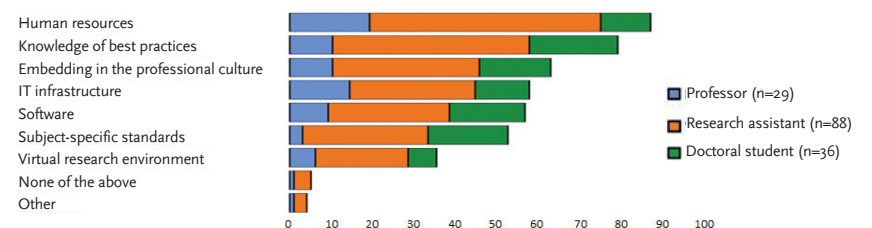


Fig. 3: Needs and desires by status group in 2021 at the Humboldt-Universität zu Berlin. The absolute numbers for the individual status groups are given.

The results of the needs survey were also placed in relation to the previous survey from 2013 (Simukovic, Kindling & Schirmbacher, 2013) and published (Jäckel, D., Helbig, K. & Odebrecht, C. (2022) "Desiderate zum Forschungsdatenmanagement 2013 und 2022" Information – Wissenschaft & Praxis. 73:265-276. <https://doi.org/10.1515/iwp-2022-2239>).

The comparison of the development of FDM over time at the Humboldt-Universität zu Berlin showed a positive development of storage locations away from the private and towards the local official computer and the various institutional solutions. Over the years, the most frequently generated and used data types remained the same: texts, images or graphics and tables. Compared to 2013, researchers show a greater need for advice and training on DMPs as well as on general FDM implementations. In addition, the topics of storage, backup and archiving as well as legal and legal issues continue to be desired.

2013	#	#	2021
Texts	1	1	Texts
Tables	2	2	Images/graphics
Images	3	3	Tables
Databases	4	4	Statistical data
Programmes and applications	5	5	Databases
Audio recordings	6	6	Audio/Movies/Videos
Video recordings	7	7	Modelling/visualisations
Subject- or device-specific data	8	8	Measurement data/measurement series
Multidimensional visualisation or models	9	9	Self-developed or further developed software
Other	10	10	Mathematical calculations and algorithms
		11	Geo data (GIS data/topographic data)
		12	Device-specific data in proprietary file formats
		13	Device-specific data in free file formats
		14	Other
		15	None of the above

2013	#	#	2021
Official computer	1	1	Locally on my work computer
Private computer	2	2	Cloud storage at the Humboldt-Universität zu Berlin
Server in the institute	3	3	Server of the institute/working group/university (e.g. network drives)
Server of the HU	4	4	Locally on my private computer
External at a commercial provider	5	5	Data carrier (e.g. USB stick, external hard drive)
Other	6	6	External cloud storage (e.g. DropBox, Google Drive)
Externally at a scientific institution	7	7	External generic storage (e.g. GitLab, Zenodo)
		8	Other
		9	Server of my association partner
		10	External subject-specific offer (e.g. WDCC, SSOAR, PANGAEA)

2013	#	#	2021
A secure and reliable storage space for my research data	1	1	Data management plans
Advice on legal issues (e.g. access restrictions, handling sensitive data, use of licences)	2	2	Storage, backups and archiving
Advice on technical issues (e.g. metadata, standards, long-term archiving)	3	3	Legal issues (e.g. copyright)
Advice on publishing and citing research data	4	4	General introduction to handling research data
Advice on general questions about handling research data	5	5	Data documentation
Support with specific matters (e.g. submitting a manuscript to a journal that specifies publication of research data)	6	6	Publication (e.g. search for suitable repositories, data publication)
Support in drawing up a data management plan, if such a plan is encouraged by the funding organization	7	7	Metadata, data standards and archiving
I do not need any services	8	8	Software documentation and archiving
Other	9	9	Requirements of the funding agencies
		10	Citation and referencing of research data
		11	Other
		12	None of the above

Fig. 4: Representation of the data types used (top), storage locations (middle) as well as needs and wishes (bottom) sorted by their frequencies in the years 2013 and 2021 at the Humboldt-Universität zu Berlin.

For years, researchers have been familiar with the guidelines of the research group/project, the requirements of publishers and the DFG, but hardly with the requirements of Horizon 2020/Europe, the guidelines of the professional societies, the institution's own research data policy or the FAIR criteria.

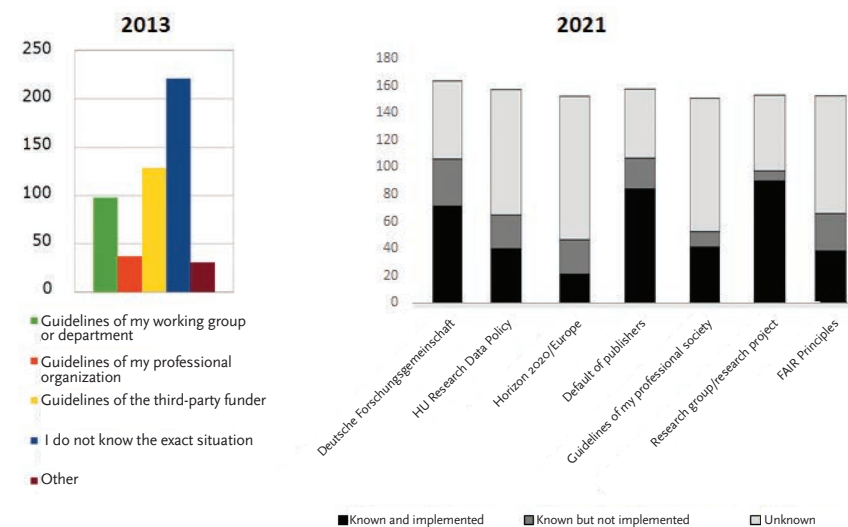


Fig. 5: Awareness of policies, guidelines and recommendations in the years 2013 (Simukovic, Kindling & Schirmbacher, 2013) and 2021 at the Humboldt-Universität zu Berlin.

The results of the needs assessment provide a good overall view of the current FDM desiderata of the researchers and serve as the basis for the development of a strategy, to which the HU will gradually devote the next few years.

Research data

Institutional research data management with IT service management

Anna Lehmann

Institutional research data management (FDM) must face the challenge that scientific datasets are becoming increasingly complex and often digitally processed. This is leading to an ever-increasing use of FDM services [1]. The CMS is responding to this development with the methods of IT service management and the creation of a maturity model.

HU Berlin's goal of offering institutional FDM services for all stages of the research data lifecycle can be achieved if suitable services are developed as IT infrastructure components that can be integrated.



Fig. 1: Research data life cycle

In order to be able to offer this IT infrastructure sustainably, a new perspective (that of the service-providing institutions such as computer centres and libraries) should be established in the design of institutional FDM [2]. To ensure that researchers are successfully supported in research processes regardless of discipline, the CMS is pursuing the application of the methods of IT service management (ITSM for short). ITSM comprises all measures that can be used

to support processes – primarily in companies – through the internal IT organization [3].

Despite the many challenges in implementing institutional FDM, management levels must be able to make decisions quickly and reliably. For this goal, it is necessary to comprehensively describe the current state of institutional FDM in terms of operational, strategic and institution-specific development perspectives. For this purpose, the maturity model, which puts both the methods of ITSM and the individual processes of the FDM, equivalent to the research data life cycle, in the centre of attention.

The development of such a maturity model for institutional FDM services is taking place within the DFG-funded collaborative project FDNext [4], which is funded for 36 months and aims to (further) develop tools and services for FDM. To this end, the HU Berlin is working on analysis, management and evaluation of FDM services and related technical and associated technical infrastructure from the perspective of service-providing institutions.

The first step in developing the Update FDM maturity model was to define fields of action [5], so that the model is developed on the basis of five requirements. These are: Goal, Perspective, Processes of Institutional FDM, Practices of ITSM and Reusability. From this, a map is created in a next step, which contains all roles, service and product descriptions as well as process templates. With the help of the map, a first prototype of the Update FDM can be realised, from which the next step would be workshop, and with which the institutional FDM can be strategically evaluated and operationally adapted.

The Update FDM maturity model supports the institutional FDM, as the HU Berlin is striving for: following the common standards of data management without losing sight of the needs of the researchers or violating the principles of academic operation.

[1] Oppenländer, Jonas; Glöckler, Falko; Hoffmann, Jana; Müller-Birn, Claudia, 2017. Reifegradmodelle für ein integriertes Forschungsdatenmanagement in multidisziplinären Forschungsorganisationen, in: E-Science-Tage 2017: Forschungsdaten Managen. Heidelberg: HeiBooks.

[2] HRK, 2015. Wie Hochschulleitungen die Entwicklung des Forschungsdatenmanagements steuern können. Orientierungspfade, Handlungsoptionen, Szenarien. Empfehlung der 19. Mitgliederversammlung der HRK am 10. November 2015 in Kiel.

[3] Rohrer, Anselm; Söllner, Dierk, 2017. IT-Service-Management mit FitSM: ein praxisorientiertes und leichtgewichtiges Framework für die IT, 1. Auflage. ed. Heidelberg: dpunkt.verlag.

[4] FDNext Projektwebseite: <https://www.forschungsdaten.org/index.php/FDNext>. Publikationen via Zenodo: <https://zenodo.org/communities/fdnext/>.

[5] Odebrecht, Carolin; Lehmann, Anna, 2022. Reifegradmodelle im Forschungsdatenmanagement – IT-Prozessoptimierung im Wissenschaftsbetrieb. IN: Information – Wissenschaft und Praxis. Berlin: De Gruyter Saur. (Geplante Publikation). DOI: 10.1515/iwp-2022-2249.

Research data

The CMS in the NFDI – an update

Dr. Maik Bierwirth, Kerstin Helbig

Software licences

New Adobe licensing and Affinity software suite

Christoph List, Thomas Zergiebel

In the National Research Data Infrastructure (NFDI), 26 subject-specific consortia systematically make scientific data accessible, networked and sustainably usable for the entire German scientific community. HU researchers and the CMS are extensively involved in this.

Based on a federal-state agreement of 2018, the NFDI developed gradually over three rounds of calls for proposals coordinated by the German Research Foundation. On 4 November 2022, the Joint Science Conference approved a final third group of seven additional subject consortia as well as the Base4NFDI consortium, which now enables 26 subject-specific consortia to prioritise, organise and fund common, overarching basic services such as identity and access management, persistent identifiers or terminology services. After the HU has already been involved in the NFDI since 2021 as the main applicant with the natural science consortium FAIRmat (spokesperson: Prof. Claudia Draxl), a further project has now been approved with the historical science consortium NFDI4memory (co-spokesperson: Prof. Torsten Hiltmann). CMS will participate in the consortium over the next five years with the Laudatio Repository for historical text corpora and with its expertise in FDM training and data literacy. NFDI4memory will start in March 2023, whereas the FAIRmat consortium is already actively working in the specialist community. The CMS is entrusted with the task of “Community Building and Support” and is also involved in the NFDI section “Training and Education” for the development of modular training materials that can be used by various consortia. The aim of CMS's involvement is to offer a broad range of self-learning units and training courses that are geared to the specific needs of the professional community. In addition, CMS Director Malte Dreyer represents the interests of the HU in the NFDI General Assembly on the one hand, and in the NFDI section “Common Infrastructures” on the other, in which aspects of the cross-consortium use of information infrastructures are discussed and worked on. Furthermore, HU researchers participate in the consortia DataPlant, NFDI4Earth, Text+, NFDI4Culture, PUNCH4NFDI and NFDI4CS. Prof. Petra Stanat from the IQB is also part of the 13-member Scientific Senate of the NFDI. Prof. Vivien Petras from IBI was elected to the NFDI Board of Trustees by the General Assembly. The HU Berlin is therefore strongly represented in the NFDI overall.

The current contract with the company Adobe for the use of their software products makes it necessary to switch from serial number-based licensing to personalised user accounts. From 2023, the Affinity software suite will also be available as an alternative.

The Humboldt-Universität zu Berlin (HU) has held a new campus contract with Adobe since November 2021. This includes licences for Acrobat DC and the applications of the Creative Cloud Suite (e. g. Photoshop and InDesign) for all employees of the HU. In addition, these products can also be on HU equipment (e.g. PC pools) by students. However, the current contract includes changes in licensing. It provides that the HU will no longer receive licence keys for the activation of Adobe products, but that a personalised user account must be created for each user, which authorises the person to run Adobe software. The HU may still use licence keys for a transitional period, but must finally switch to licensing via personalised user accounts in 2023. Firstly, this means that personalised user accounts will be created in the cloud for all users who wish to use the licensed Adobe programmes. The implementation should be as data-saving and self-determined as possible. In addition, the way in which software is provided must also be adapted. At the same time, questions of a strategic nature arise regarding the type and scope of the future use of Adobe programmes at the HU. In order to be able to continue to provide Adobe products at the HU in line with demand after the existing contract expires in November 2024, the CMS will conduct surveys on their use and evaluate alternative products. As a first step, the Affinity software suite has been available since the beginning of 2023 as an alternative to the Adobe Creative Cloud products. The Affinity apps can be installed and used by employees and students alike, unlike the Adobe Creative Cloud products. All measures related to the new Adobe contract are combined in one project in the CMS. It is expected that findings from the procedure will be needed for many software products in the future, as licensing via personalised user accounts is becoming more and more important, as more and more manufacturers are introducing licensing.

Software Licence Campus Agreements

Thomas Zergiebel

The use of software licences from campus agreements is regulated by special contracts of the HU. As a rule, the purchase is made via the IT managers.

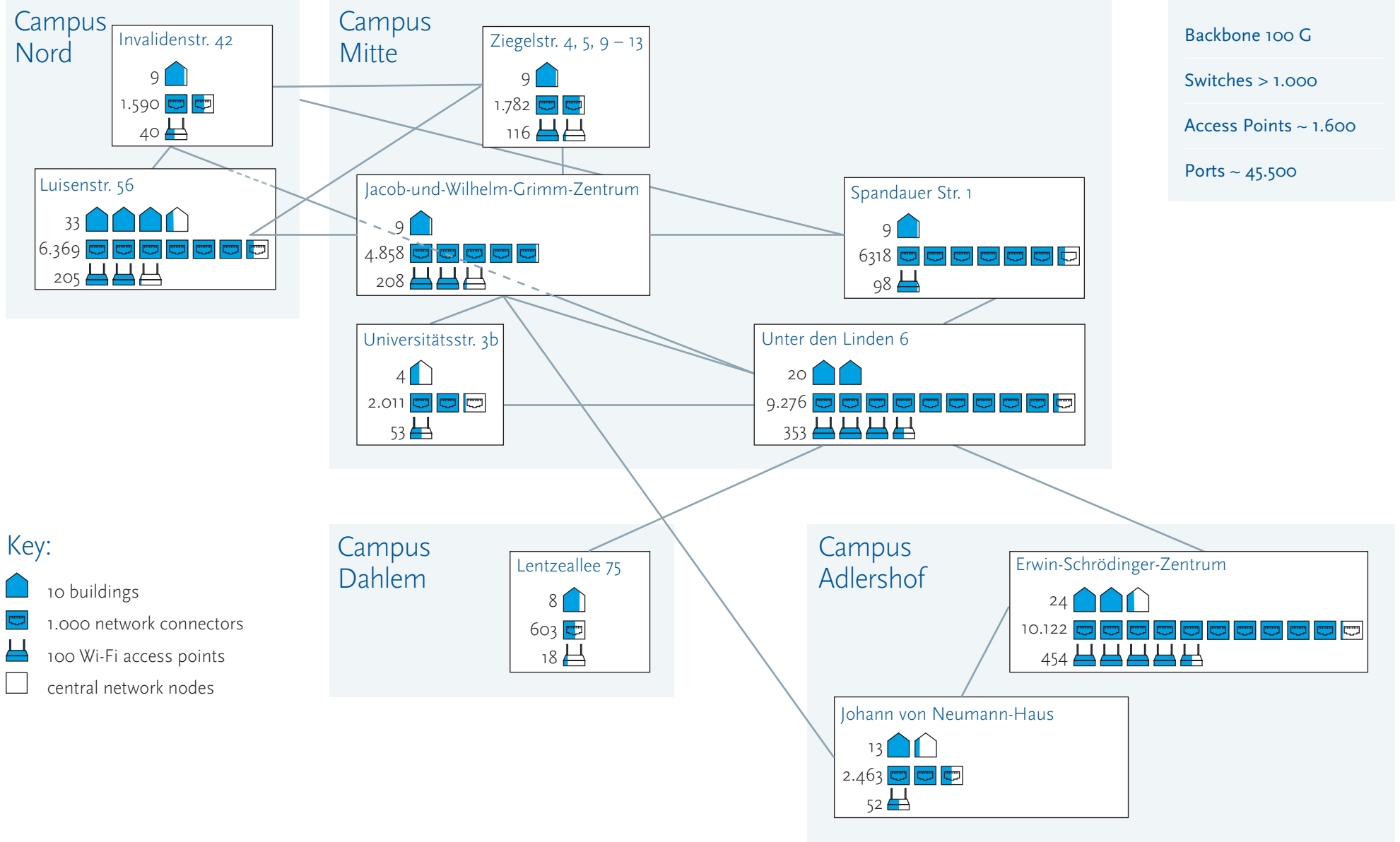
Software / Contract	Licensor	Platform	Licence form
Adobe ETLA-FTE – Creative Cloud Enterprise	Adobe Deutschland	WMT	unlim CL, RL
Affinity	Serif Europe Ltd	WMT	unlim CL
ArcGIS	ESRI Deutschland GmbH	W	unlim CL, RL
Camtasia und Snagit	TechSmith	WM	RL
ChemDraw Prime	PerkinElmer, Inc.	WM	unlim CL, RL
Citavi for Windows	Swiss Academic Software	W	unlim CL, RL
Corel Academic Site Lic. (CASL)	Corel Corp.	W	unlim CL, RL
Endnote	Clarivate Analytics	WM	unlim CL, RL
Gaussian 16	Gaussian, Inc.	U	unlim CL, ML
G Data Endpoint Protection	G Data Software AG	W	lim CL
LinkedIn.learning	LinkedIn	Browser	lim CL
Maple	MapleSoft	WMLS	lim CL, RL
Mathematica	Wolfram Research, Inc.	WML	unlim SL, RL
MathType	Design Science, Inc.	WM	unlim CL
Matlab	The Mathworks, Inc.	WMLS	lim CL, RL
MAXQDAplus	MAXQDA	WM	unlim CL, RL

Software / Contract	Licensor	Platform	Licence form
Microsoft EES (Windows Upgrade, Office, Enterprise CAL, RDS CAL)	Microsoft GmbH	WM	unlim CL, RL
Microsoft Select	Microsoft GmbH	W	SL
SAS	SAS Institute GmbH	W	lim SL, RL
SPSS	IBM Deutschland	WM	lim SL
Sun Standard Software Support	Oracle Corp.	S	unlim CL, RL
SYSTAT-Software (SigmaPlot, SYSTAT, SigmaStat, Sigma-Scan, TableCurve, PeakFit)	Systat Software GmbH	W	SL
Zoom	Zoom	WMLT	CL, RL

Explanation

W, M, L, S, T, U Windows, Mac, Linux, Solaris, Tablet-Computer, Unix
 lim, unlim limited, unlimited
 SL, DL, CL, RL single licence, department licence, campus licence, rental licence

Annual report HU Network Map



Distribution of Wi-Fi users

Mitte 57 %

Adlershof 19 %

Nord 23 %

Dahlem 1 %

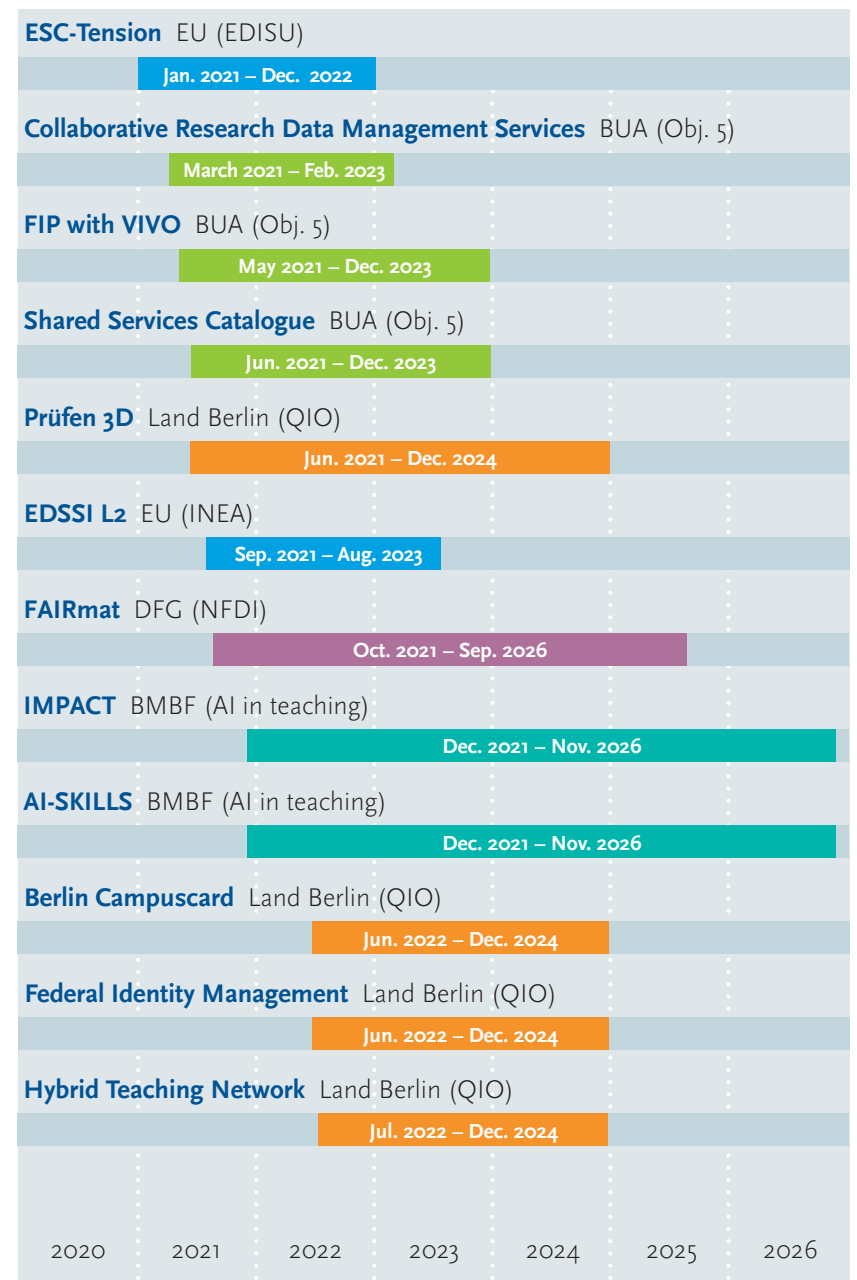
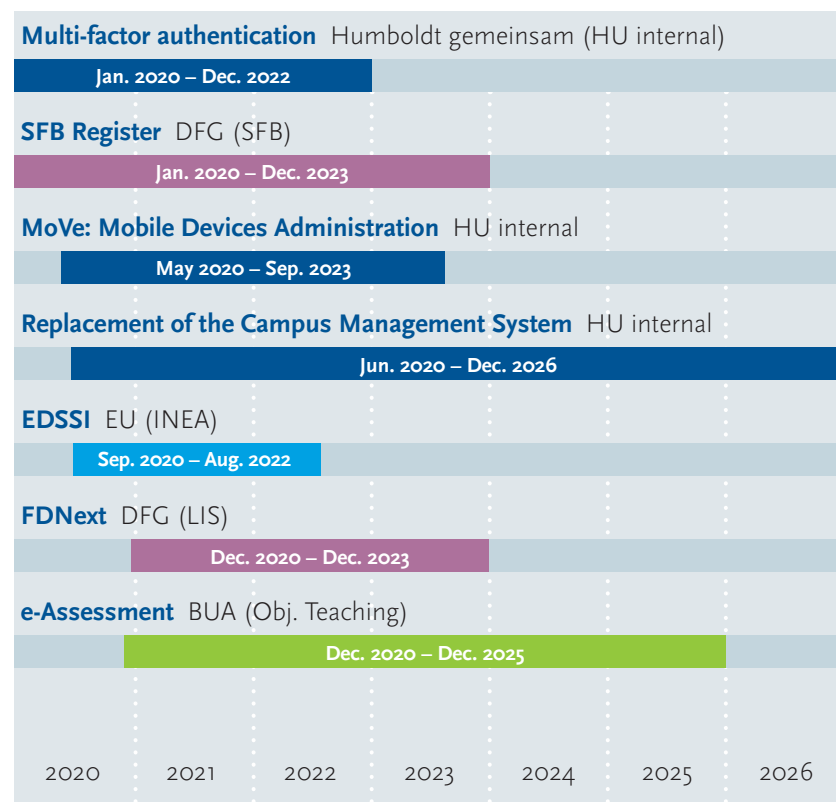
Annual report Project overview

The CMS is increasingly involved in externally funded projects or takes the lead itself. In addition to these externally funded projects, there are also HU-internal projects with a limited duration.

Below is an overview of the projects currently running at the CMS with project name, funding body, funding line and duration.

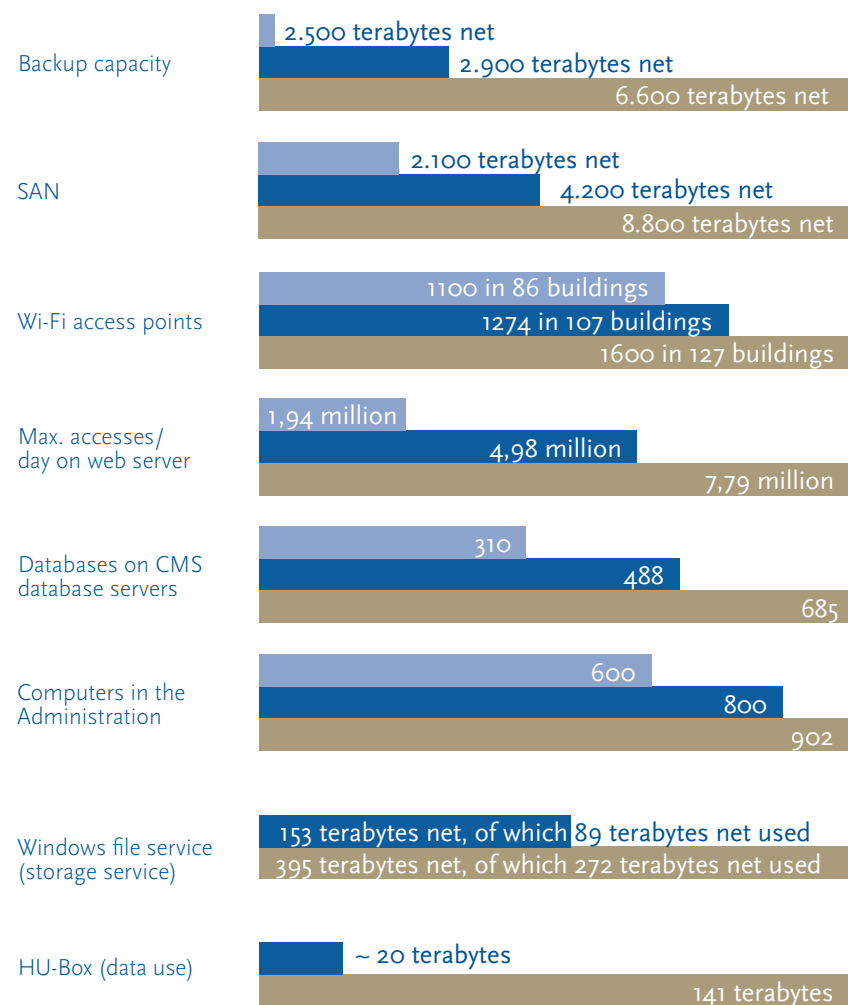
Link to the project overviews:

<https://www.cms.hu-berlin.de/de/ueberblick/projekte>



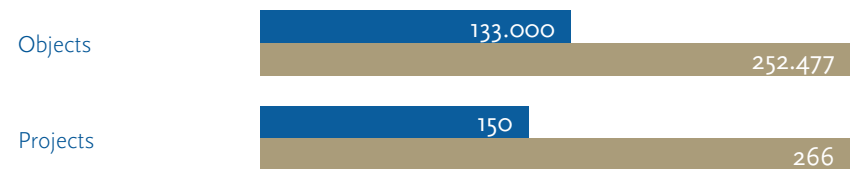
Annual report CMS in figures

Compared to the years 2013 and 2017, the statistical data for the year 2022 illustrate the constantly growing use of IT services at the HU:

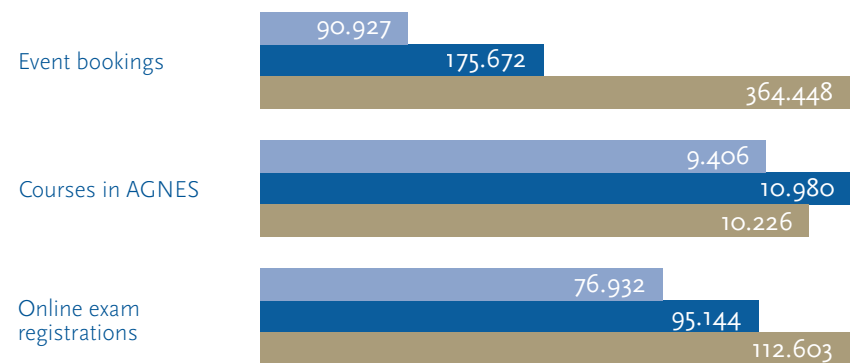


Media Repository:

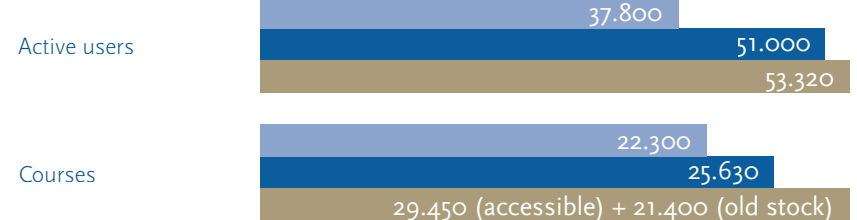
New and consolidated in the media repository in 2014



AGNES:



Moodle:



year 2013
year 2017
year 2022

AGNES (Teaching and Examination Online)

In AGNES you can find all courses at the HU with information on lecturers, office hours, room schedules, timetables, degree programme schedules, etc. You can register directly for numerous courses via the online registration. A large part of the examination registrations are also made centrally via AGNES. Certificates of study and student record pages are created and the transcript of records as well as all exams already registered can be viewed at a glance.

Backup service

The CMS backup service automatically backs up data from servers within the HU network. To use the backup service, the computer to be backed up must be registered in the CMS. In addition to the backup, data can be archived so that the local memory on the server can be released.

Blog farm

The CMS operates a blog farm in the form of a central WordPress installation, in which HU members and projects can easily set up an individual blog. Users do not have to worry about technical administration or maintenance. For the integration of different elements, such as images or footnotes, additional plug-ins are pre-installed.

Building Information System (GIS)

The CMS uses its own map material in the GIS to display the location of almost all HU buildings, linked with additional information on the buildings and on the resident institutes and staff. This allows users to orientate themselves across the HU's distributed locations and locate contact persons.

Calendar service

The CMS calendar service offers digital appointment, task and address management. Access is possible via separate applications, which are available for Windows, macOS and Linux, as well as via a web interface. Synchronisation with various mobile devices is possible.

Campuscard

The Campuscard is the electronic, multifunctional student ID card of the HU Berlin. It also functions as a canteen card, library card and semester ticket. The Campuscard is a project of the CMS and eight other universities and is also used at numerous other Berlin universities.

Cartographic services

On the basis of its own map material, CMS produces individual maps for special applications, e.g. as directions for conference material, flyers or websites.

Central Information System (ZIS)

The contact details of Humboldt-Universität staff can be viewed in the Central Information System (ZIS). The service is operated by the CMS and is maintained decentrally by the respective HU institutions. In addition, the central address LDAP server is updated via the ZIS, which contains further information such as personal certificates and administrative contacts.

Certificate services

The certificate service of the CMS (PKI service) issues digital advanced certificates based on the X.509 standard. This makes it possible to provide messages (e.g. e-mail) and documents with advanced electronic signatures in a legally secure manner in accordance with the eIDAS Regulation. Furthermore, messages and documents can be cryptographically (asymmetrically) encrypted. Applicants receive so-called Class 3 / identity certificates for this purpose. Service operators (e.g. web/email/VPN server services) receive certificates for authentic and secured client-server connections (e.g. https, TLS, STARTTLS, ...) upon request. In addition, 802.1X certificates are offered for access to the HU WiFi network (eduroam).

Chat service

The chat service offers encrypted individual or group communication between HU members as well as unencrypted communication with external persons on the basis of the open XMPP protocol. It is a fast, uncomplicated solution to coordinate and discuss in groups. It is also possible to send files via the service. The service can be used both via a web interface or with a dedicated client. Clients are available for all relevant operating systems. Depending on the programme used, audio or video chats are possible in addition to text chats.

Computer training rooms

The CMS operates training rooms with IT equipment at the Mitte (Grimm-Zentrum) and Adlershof (Erwin-Schrödinger-Zentrum) locations. They are equipped with workstations, lecturer PCs, whiteboards and projectors and can be booked by HU institutions.

Database service

The CMS database service provides PostgreSQL and MySQL databases for HU members and takes over the administration and maintenance of the associated database management system. The administration of the data is the responsibility of the users. With the help of databases, large amounts of information can be stored in a structured way and retrieved quickly. Many web systems use databases as a substructure for the permanent storage of their data.

Element / Matrix

Element and the communication protocol Matrix are a privacy-compliant chat and messaging solution for most mobile devices and computers. The open-source service is available to all HU members: In Matrix, one can freely and spontaneously create rooms for communication between individuals or for entire groups. These can be open or closed user groups, e.g. courses, research projects, institutes or their departments. All personal devices are kept in sync via the HU home server, one can also participate in rooms of other matrix servers or, conversely, invite third parties to the HU. The service is run on HU servers and supports end-to-end encryption (E2EE). Matrix/Element is part of the HU Digital Teaching and Learning Landscape (HDL3).

Fault information

The website on which the malfunction reports are published is the first source of information for all users about current disruptions to CMS services and planned outages due to maintenance work on central IT technology.

Further education

The CMS offers IT-specific continuing education events that are integrated into and administered by the Humboldt-Universität's Continuing Professional Development programme.

Graphics service

The graphics service supports the creation of digital print templates for posters, flyers or brochures. In addition, it helps with layout questions with Adobe InDesign.

Hardware Service

The hardware service offers problem analysis and troubleshooting for PCs, servers and in the LAN or mediates this. In the run-up to hardware procurement, appropriate support is provided if required. Furthermore, notebooks and PCs can be borrowed from the hardware service.

HU-Box

The HU-Box is a secure storage facility for files in the CMS data centre. With the integrated office solution OnlyOffice, texts, tables and presentations are collaboratively edited directly in the browser. Files can also be shared with HU externals, e.g. for cross-institutional cooperation. HU Box users define which files are shared and who has access. There is also a 30-day file versioning to restore previous versions. The files in the HU-Box are encrypted on the client side using the desktop client.

Image processing

The “Digital Media” department of the CMS supports users of digital image processing and design, as well as with creative questions. In particular, it advises on the use of digital image processing programmes.

Mailing lists

With this service, mail distribution lists, with which emails are sent to several recipients at the same time, can be set up and managed. These lists receive their own e-mail address and can also be archived by the system if desired. This makes it possible to view older contributions retrospectively.

Mail service

HU members receive their own HU mail addresses. The mails can optionally be encrypted, and the CMS offers numerous features such as forwarding, filtering on delivery (server side filtering), spam filters and absence notifications. The HU mails can be retrieved via the web interface or with any usual mail client.

Media Repository

With the Media Repository, the CMS offers researchers a system for managing digital media data that supports not only images and texts but also audio and video content.

The system manages a variety of file formats and metadata. It stores and organises media data and helps to organise work with them. Open web presentations are just as possible as collaborative work in closed working groups.

Media technology

Media technology is responsible for the maintenance and upkeep of the projection and audio reproduction technology in the central rooms of the Campus Adlershof campus, especially in the Erwin-Schrödinger-Zentrum. Furthermore, lecturers and teachers are trained for special events such as conferences, colloquia or festive events.

Moodle

HU-Moodle is the digital learning platform of the HU. It is the central point of contact for the digital teaching offers: Many practical modules are part of Moodle, further offers of the HU Digital Teaching and Learning Landscape (HDL3) are integrated, such as HU-Zoom and Big Blue Button, the online word processor OnlyOffice and the video management Opencast. Messaging with Matrix/Element is on the way. Courses via webinar, digital teaching materials in the form of audio, video or text, self-learning tests, assignments can thus be offered via HU-Moodle. Students can also and organise their group work themselves in Moodle rooms. There is a specialised examination Moodle for examinations. HU-Moodle can be used flexibly to support courses, projects, working groups or committees – wherever web-based communication in open or closed spaces facilitates work.

Network operation (HU network, LAN)

The CMS operates the central network infrastructure of the Humboldt-Universität as well as the connection to the Internet – in connection to the nationwide network infrastructure of the DFN-Verein and to the Berlin science network BRAIN. The bandwidth to the Internet is currently 1 Gbps. The HU's backbone network is based on 10 Gigabit Ethernet technology. In order to maintain an overview with several thousand end devices and

to be able to react promptly if necessary, the aspects of network and fault management are of central importance.

Online survey service

LimeSurvey is a self-explanatory tool for creating web-based surveys. The CMS offers this service on its own system in order to keep the data storage of these surveys local. Programming skills are not necessary for the users. The software itself is open source, i.e. it can be used free of charge.

Overleaf

Overleaf allows the collaborative creation and editing of documents, including real-time comments and chat function for exchange. Teachers can offer course assignments as templates, which can be completed online by course completed online. Functions such as real-time preview or the integrated WYSIWYG editor (“What you see is what you get”) allow even LaTeX laymen to create and edit documents.

Print service

The print service produces print products in DIN A4 to DIN A0 format and special formats with a maximum roll width of 1.56 m on special paper or special materials. Flyers and brochures can also be produced in small runs.

Project management solution (OpenProject)

OpenProject is a project management solution based on open source. It is aimed at HU researchers and all other HU members who have to coordinate larger projects in a team. HU externals can also participate in OpenProject. OpenProject structures projects into clear work phases and packages so that the overall project and the individual steps can be kept in view at all times. Convenient filters, sorting and Gantt views facilitate project coordination, and individual project members have an overview of their specific tasks including deadlines, dependencies, etc. at all times. OpenProject alternatively manages projects according to the Scrum model, which is particularly common in agile software development.

Public computer workstations (ÖCAP)

The CMS offers a total of approx. 700 public computer workstations in the Grimm-Zentrum in Mitte and in the Erwin-Schrödinger-Zentrum in Adlershof for individual or group use of our IT services for students and lecturers. The computers have access to a comprehensive range of software for university use and, in cooperation with the university library, library services can also be used directly.

Research Data Management

The Research Data Management Initiative advises and supports individual researchers as well as research groups, projects or institutes in the management of their research data and its sustainable preservation. Furthermore, the organization of training courses and the provision of information materials are part of a joint offer of the initiative by the CMS, the Service Centre Research as well as the University Library and the Vice President for Research.

Rooms

At the Adlershof location and at the Grimm-Zentrum in Mitte, various event rooms, such as the public computer workstations (PC rooms), the training rooms, the rooms for video conferences as well as the video editing workstations, in Adlershof additionally also the central lecture halls and teaching rooms, are technically maintained by the CMS.

SAN (Storage Area Network)

The SAN of Humboldt-Universität provides fail-safe and freely configurable hard disk capacity for HU servers, which are administered by local managers. Additional services, such as snapshots or replication to a remote location, can also be arranged for these hard disks. Technical security is ensured by simple redundancy and the distribution of servers and storage across several HU buildings. Secure, locked rooms with uninterruptible power supply are available for this purpose at the respective locations.

Scanning service

For the scanning of documents, also double-sided and up to a format of A3 format, the scanning service is offered.

Schedule planner of the DFN

The appointment planner is a web service offered by the DFN-Verein and recommended by the HU, which facilitates the difficult coordination of appointments between several people. Due to the clear presentation, it is also possible to coordinate appointments within a larger group of people.

Software as a Service (SaaS)

Via the HU Desktop (SaaS), the CMS provides all HU employees and HU students with a Microsoft Windows environment with the same comprehensive software package as at the öCAP directly on campus. Via a network connection, this offer can be used from any location with almost any client computer (Mac, Linux PC, Android or iOS mobile phone, etc.) via a remote desktop connection (RDP) or with an internet browser. The personal working environment (network drives) is provided.

Software service

As a central instance, the CMS procures software for the HU and its members, which can be requested via the IT officers of the institutions. There are central campus agreements for frequently used software.

Terminal Server Services

The CMS provides central terminal server services to support the operation of decentralised computer (pools) of the HU. In the sense of “Desktop as a Service”, client user interfaces with standard software are offered by central servers. Specific requirements can be met to a certain extent. When using this service, almost all management and administration effort for the operation of public computer workstations is unnecessary.

User Advice

The user advisory service is the first point of contact for questions about all services of the CMS, hardware problems, software questions or also for assistance in setting up the Wi-Fi (1st level support). In particular, it manages the HU accounts and can provide appropriate support in this regard.

Video conferencing service

The CMS offers IT services for conducting video conferences between HU members and with external participants. In addition to the services, the CMS also provides special rooms or technology for videoconferencing and advises on questions of technology, equipment and the choice of the right service. An overview of the rooms offered for videoconferencing can be found on the further pages of the videoconferencing service, as well as an overview of the available rental equipment. The recommended service depends, for example, on the number of participants, the data protection requirements or the additional functions needed.

- DFNConf: solution for video conference rooms in institutions
- BigBlueButton: secure video conferencing for administration and teaching
- Zoom: software solution for large meetings and lectures

Video service

The CMS offers video and audio services for HU members. This includes a copying service, technology rental and the supervision of editing suites up to a complete video production.

Virtual Private Network (VPN)

Via the Virtual Private Network (VPN), HU members can connect their mobile devices and PCs worldwide to the HU network. In this way, HU-internal services such as online publications, special databases and software can be used while on the road or in the home office. The VPN software encrypts the data transfer for security.

Webfiles

Webfiles allows access to Windows network drives from home or on the road with a web browser or WebDAV client (e.g. Windows Explorer, Mac OS Finder). VPN access is not necessary for this.

Web analysis platform (Matomo)

Matomo (formerly Piwik) is a free and open-source web analysis platform, which provides insight into the use of websites with a wide range of functions. In addition to the usual click figures, it also provides information on how users and search engines deal with the content. Matomo essentially shows overviews of the analysis of important key data relating to page visitors (e.g. country of origin, operating system, browser used), the number of page views, unique visits, the time spent on the website, the bounce rate, access times, the number of returning visitors, the most frequently visited pages, the URLs of entry and exit pages, outgoing links, referrers (direct access, search engines, website) and search terms used.

Web hosting (for institutions and projects)

Web hosting for institutions and projects serves the comfortable creation of websites by institutes and working groups. The CMS provides infrastructure and storage space for setting up and publishing websites. Here, Plone is the central content management system for web presences and the www2 server is the platform for project websites.

Wikifarm

The CMS operates a wikifarm on the basis of a central MediaWiki installation, in which HU members can operate wikis for collaborative work, also with people from outside the HU. Operation and maintenance of the wiki is carried out by the CMS.

Windows domain management

The CMS creates and administers Windows domains for user management in the PC network on the basis of Active Directory. These domains can be used by institutes and their IT representatives, e.g. to manage their own users and their access rights.

Windows file service

The CMS makes storage space available to the HU institutes by agreement, which can be used as a network drive on the PCs (via SMB protocol). The distribution of the storage space provided and the access rights are managed by the institutions themselves.

Wireless LAN (WLAN)

The CMS operates more than 1,400 access points in over 100 HU buildings, to provide wireless Internet access, especially for mobile devices. The HU-WLAN is part of the eduroam initiative, which provides WiFi access points at universities across Europe.

The complete directory of IT services and services of the CMS can be found at <https://hu.berlin/dienste-db>



Annual report

The CMS in associations and organizations

The CMS is involved in numerous organizations that deal with IT and higher education topics. It is involved in working groups, committees, boards and advisory councils in order to keep an eye on current developments and best practices and to represent the interests of the Humboldt-Universität.

ZKI – Zentren für Kommunikationsverarbeitung in Forschung und Lehre e. V.

At the Zentren für Kommunikation und Informationsverarbeitung in Lehre und Forschung e. V. (ZKI), CMS is involved in the working groups Network Services, IT Service Management, Software Licensing, Strategy and Organization, among others.

AMH – Arbeitsgemeinschaft der Medieneinrichtungen an Hochschulen e. V.

The CMS is active on the board of the AMH. In addition to two annual conferences, the AMH organises workshop series on media technology (with the ZKI) and event recording.

RDA Deutschland – Research Data Alliance Deutschland (RDA DE) e. V.

The CMS is a member of RDA and active on the board of RDA-DE. The RDA community in Germany wants to contribute to increasing the exchange of data and making the reuse of data more efficient. It comprises all those data experts in Germany who are involved in RDA or have an interest in the results of RDA.

DINI – Deutsche Initiative für Netzwerkinformation

The CMS is represented on the board of the Deutsche Initiative für Netzwerkinformation (DINI e. V.), an initiative of AMH, dbv (Deutscher Bibliotheksverband e. V.) and ZKI. The CMS is involved in the working groups E-Learning, DINI/nestor-AG Forschungsdaten, Viktas and the DINI competition.

EUNIS – European University Information Systems

The CMS is involved in the task forces Student Mobility and Information Security.

EUNIS is the European organization for information systems at universities and research institutions. Its task is to support member institutions in developing their IT landscape and to create European synergies. and to create European synergies.

European University Foundation (EUF)

The EUF is a network of universities committed to the creation of a modern European Higher Education Area. The EUF is also an influential advocate for substantially increasing the quantity and quality of student mobility, regularly putting forward new ideas, strategies and recommendations.

Moodle an Hochschulen e. V.

Moodle an Hochschulen e.V. is an association founded on 22 July 2021. The current 36 member universities, together with their more than 700,000 students, represent the interests and objectives of the use of Moodle at universities. The Humboldt-Universität is a founding member and serves on the board.

OSB Alliance

The OSB Alliance – Bundesverband für digitale Souveränität e.V. (Federal Association for Digital Sovereignty) represents around 200 member companies in the open source industry. Together with academic institutions and user organizations, the OSBA works to sustainably anchor the central importance of open source software and open standards for a digitally sovereign society in the public consciousness.

VIVO

VIVO is a member-supported open source software for research and visualisation of researchers and their activities. As part of the Research Information Platform with VIVO project, CMS holds Gold Member status. As part of the VIVO Leadership Group, it actively contributes to the further development of the software in order to contribute and meet the needs of the German-speaking community in particular.

CMS employees are also involved in subject-specific working groups or projects, for example on issues of campus management and card, Plone or research data management, as well as in regional Berlin-Brandenburg IT and university working groups.

Memberships

AMH Arbeitsgemeinschaft der Medieneinrichtungen an Hochschulen e. V.
DFN Verein zur Förderung eines Deutschen Forschungsnetzes e. V.
DINI Deutsche Initiative für Netzwerkinformation e. V.
EUJ European University Foundation
EUNIS European University Information Systems
ZKI Zentren für Kommunikation und Informationsverarbeitung in Lehre und Forschung e. V.
Moodle an Hochschulen e. V.
RDA e. V.

Executive Board memberships

AMH Arbeitsgemeinschaft der Medieneinrichtungen an Hochschulen e. V.
DINI Deutsche Initiative für Netzwerkinformation e. V.
Moodle an Hochschulen e. V.
RDA Deutschland e. V.

Organization of regular events and activities

IT Seminar of German Universities and Colleges
ZKI and AMH Workshop Media Technology
ZKI workshop and surveys of the AK Strategy and Organization

Cooperation in working circles (WC) and working groups (WG)

WG Berlin eduroam
WG of those responsible for LMS (Learning Management System) in Berlin
WC Voice Bundesverband der IT-Anwender e. V. (Federal Association of IT Users)
WC HIS-LSF (Teaching, Studies, Research)
WC Internet Services of the Berlin Universities
WC Mail - meeting of Berlin and Potsdam mail admins
WC Plone at universities
WC on Practical Semesters at Berlin Universities and Senate Administration
WC Software Licences
WC Voice Bundesverband der IT-Anwender e. V. (Federal Association of IT Users)

BRAIN Planungsgruppe – Planning Group of the Berlin Academic network BRAIN
Advisory Board for Research Data Management of HIS eG
B2-IT: Berlin/Brandenburg Circle of IT Directors
DFN Authentication and Authorisation Infrastructure
DFN User Group Higher Education Administration
DINI-AG E-Learning
DINI/ nestor-AG Research Data
DINI-AG Video Communication Technologies and their Application Scenarios (VIKTAS)
E-Assessment-AG Berlin-Brandenburg
EOSC Taskforce on Technical Interoperability
European Student Card Project
university forum digitalisation – Network for university teaching
university forum digitalisation – Stakeholder dialogue
HRK German Rectors' Conference Commission for Digital Infrastructures
HRK/HFD-AG Digital Sovereignty
InfoSec Task Force of EUNIS
NFDI Section Common Infrastructures
NFDI Section Training & Education
Print-AG of the Berlin Universities
ResourceSpace Open Source Community
Seafle Community – Organizations of the German Seafle Community
Seafle Seadrive Open Source Community
URBOSS (University Computing Centres – User-Oriented Software-Systems)
Berlin Campus Card joint project
ZKI Identity and Access Management Working Group
ZKI Working Group Information Security
ZKI Working Group IT Service Management
ZKI Working Group IT Strategy and Organization
ZKI Working Group Network Services
ZKI Working Group Software Licences

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- Personalia:
- The CMS organigram

The CMS is divided into four departments, the helpdesk and consulting, the staff and the administration with a total of over 30 teams. The “Organization and Projects” department, the Helpdesk and Consultancy department, the staff and administration fulfil cross-sectional functions.

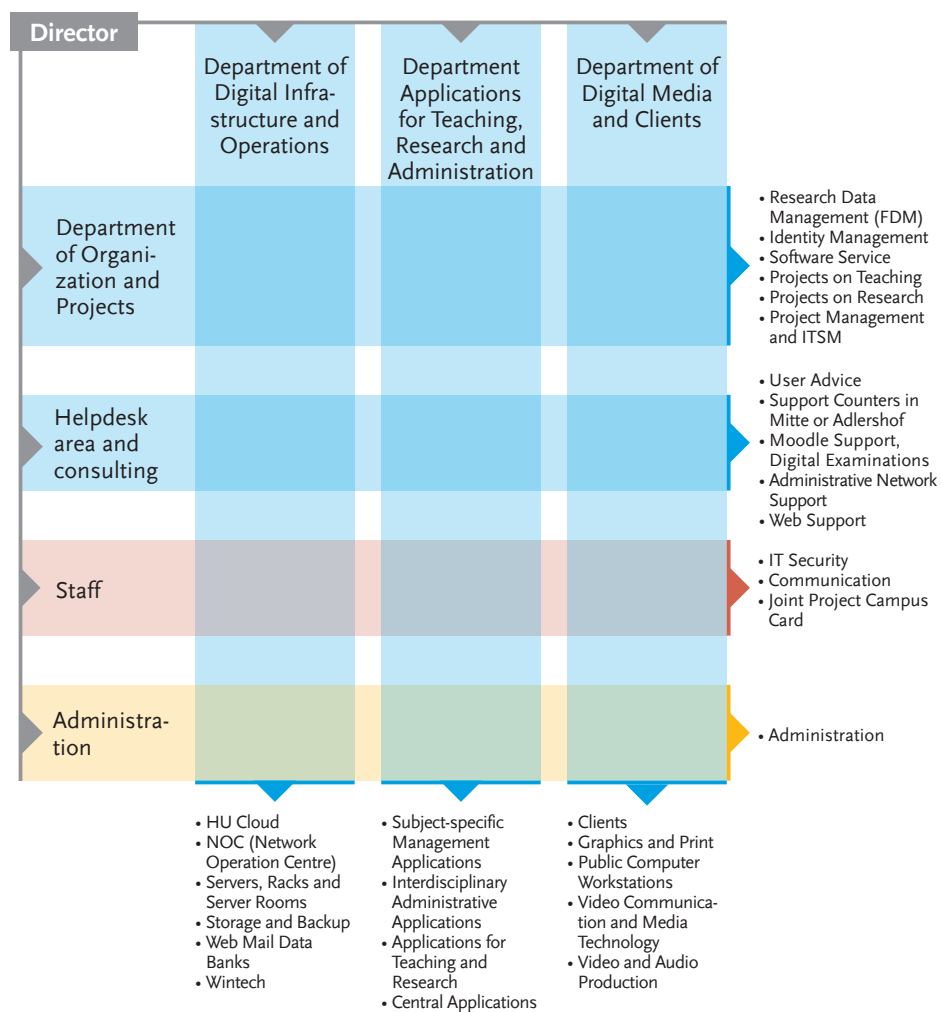


Fig.: Structure including teams

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- Personalia:
- The Management Team of the CMS



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Administration

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Support Offerings of the CMS

User Advice

1st level support for the services of the CMS, in particular for the HU account

E-mail: cms-benutzerberatung@hu-berlin.de
Telephone: 030/2093-70 000
<https://hu.berlin/amor>

Moodle Support

Advice and support for the HU learning management system

E-mail: moodle-support@cms.hu-berlin.de
<https://moodle.hu-berlin.de>

Video management in Moodle (Opencast)

E-mail: opencast-support@hu-berlin.de
<https://hu.berlin/opencast>

Digital examinations (E-Assessment)

E-m: e-pruefungen-support@hu-berlin.de
<https://hu.berlin/e-assessment>

Agnes Team

Technical support of the digital course and examination organization

E-mail: agnes@hu-berlin.de
<https://agnes.hu-berlin.de>

Digital Teaching – Tools of the Digital Teaching and Learning Landscape (HDL3)

Support for the technical and didactic implementation of digital teaching

E-mail: digitale-lehre@hu-berlin.de
<https://www.digitale-lehre.hu-berlin.de>

Video Conferencing Service

Advice and support on video conferencing solutions at the HU

E-mail: cms-videokonferenzservice@hu-berlin.de
<https://hu.berlin/videokonferenz>

Public Computer Workstations

Technical support for the öCAPs (public computer workspaces)

E-mail: cms-oecap@hu-berlin.de
<https://www.cms.hu-berlin.de/de/dl/oecap>

Media Technology (Adlershof Campus)

Supervision of media technology at the Erwin-Schrödinger-Zentrum

E-mail: medientechnik@cms.hu-berlin.de
Telephone: (030) 2093-70 020
<https://hu.berlin/medientechnik>

Video Service

Video and audio production, editing suites, equipment rental and consulting

E-mail: cms-videoservice@hu-berlin.de
<https://hu.berlin/videoservice>

Web Support

Technical support for Plone, blogs, wikis and web server WWW2 incl. setup of instances

E-mail: web-support@hu-berlin.de
<https://web-support.hu-berlin.de>

