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Rektorenkonferenz der Schweizer Universitäten
Conférence des Recteurs des Universités Suisses
Conferenza dei Rettori delle Università Svizzere
Rectors' Conference of the Swiss Universities

Translation (the German text shall be considered as being the definitive version)
The official English equivalents of laws and their abbreviations were researched and are detailed in the attached glossary, complete with references where appropriate. Where no English abbreviation exists, we have retained the German abbreviation as instructed.

Program SUC P-2
Scientific information:
access, processing and safeguarding

Foundations for the strategy

Version control

Date	Status	Handled by	Description
01.21.2013	Draft, first version	Project team, IBM Schweiz AG	Creating structure
06.27.2013	Draft, in progress	Project team, IBM Schweiz AG	Review by Steering Committee
07.31.2013	Final, Version V1.0	Project team, IBM Schweiz AG	For the attention of the Steering Committee

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1 Introduction

1.1 Background

The continuous and rapid developments in the sphere of information and communication technologies are transforming the world of research and teaching, sometimes in unforeseeable ways. The growing phenomenon of digitization permeates every scientific field, with the result that new discoveries and breakthroughs in the world of research invariably require easy access to data and state-of-the-art technology. Because of this, unrestricted access on the part of all Swiss higher education institutions to sources of scientific information is vital to the competitiveness of Swiss research and science in all disciplines.

At the same time, collaboration between researchers and between institutions is gaining in importance as far as scientific work is concerned. Researchers need access to data held by other institutions, access to their own data from any location and the ability to exchange data through collaborations.

Besides the rapid pace of technological progress and increasingly close collaboration between researchers and institutions, the exponential growth in the volume of data presents the Swiss scientific world with a major challenge.

It is against this backdrop that the Swiss University Conference (SUC) has launched Program P-2 “Scientific information: access, processing and safeguarding” (cf. Program Request [PRG_P2-A]). The program is managed by Prof. Martin Täuber (Rector of the University of Berne) and coordinated by Dr. Raymond Werlen (CRUS Secretary General) [PRG_P2].

1.2 Foundations and general context

1.2.1 Information about the CRUS

The CRUS represents all of Switzerland’s universities in their relationships with the political authorities, economic spheres, social and cultural institutions and the general public and its aim is to promote the shared concerns of its members and look after their interests. It is dedicated to the aims of coordination and cooperation in teaching, research and services and helps safeguard education and science, in accordance with the mission and objectives of the institutions it represents.
The CRUS serves as a platform for information exchange, the harmonization of academic processes and the appropriate division of tasks at universities and universities of applied sciences. It is also increasingly involved in international collaboration, particularly with the relevant committees at higher education institutions in other countries, a fact which has led the Swiss federal government to entrust it with the task of coordinating the Bologna Declaration at Switzerland’s higher education institutions.

1.2.2 Foundations

The message regarding financial aid to education, research and innovation in the period 2013-2016 [BFI] presented by the Swiss Federal Council on February 22, 2012 was passed by parliament on September 28, 2012. On the basis of this message and the funding it pledges, the SUC has commissioned ten programs and nine cooperation and innovation projects over the period from 2013 to 2016 [SUC]. Program SUC P-2 “Scientific information: access, processing and safeguarding” is the second of the ten programs [PRG_P2].

1.2.3 General context

Research at higher education institutions and universities is in a state of flux. The Federal Act on University Funding and Cooperation in the Field of University Education [UFundA] currently applies to

the university sector. In the short to medium term, the UFundA will be replaced by the Federal Act on the Funding and Coordination of the Higher Education Sector [HEdA]. It is likely that there will be a transitional period of several years prior to the new law taking effect. Unlike the UFundA, the new HEdA also applies to universities of applied sciences. The following two excerpts from the HEdA are particularly likely to have a bearing on the SUC P-2 program:

Article 3: *"With regard to collaboration in the higher education sphere, the Federal Government is pursuing the following objectives in particular: […]*
h. national coordination and division of tasks in higher education policy in particularly cost-intensive areas. [...]" [HEdA]

Article 47; Paragraph 3: *"The Federal Government may provide financial aid in the form of subsidies for the shared infrastructural facilities of higher education institutions and other institutions in the higher education sphere if the infrastructural facilities fulfill tasks of national relevance. These subsidies will not exceed 50 percent of operating expenditure."* [HEdA]

Whether and to what extent these articles apply to this program is a moot point which must be addressed during the course of the program.

The organizations affected by Program P-2 are subject to very different legal constraints in terms of the management and holding of information. This is because some are public sector organizations and others belong to the private sector, to which fundamentally different legal requirements apply.
Public sector organizations can be divided into higher education institutions owned by the Federal Government (ETH and EPFL (Swiss Federal Institutes of Technology)) and cantonal higher education institutions, to which different legal constraints may apply. Figure 1 below categorizes the organizations covered by Program P-2 according to their legal form.

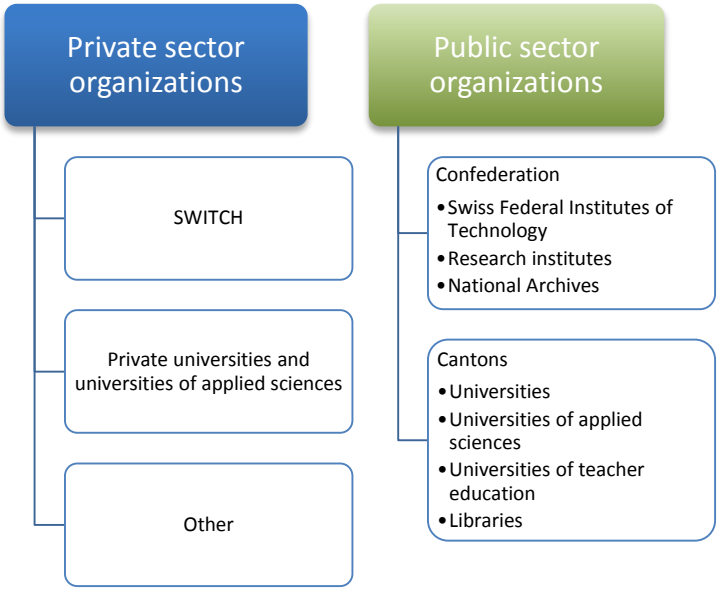

Figure 1: Private and public sector organizations

Figure 2 below sets out the key legal constraints governing access to and the processing and safeguarding of information. The constraints must be thoroughly assessed when the detailed specifications are drawn up.

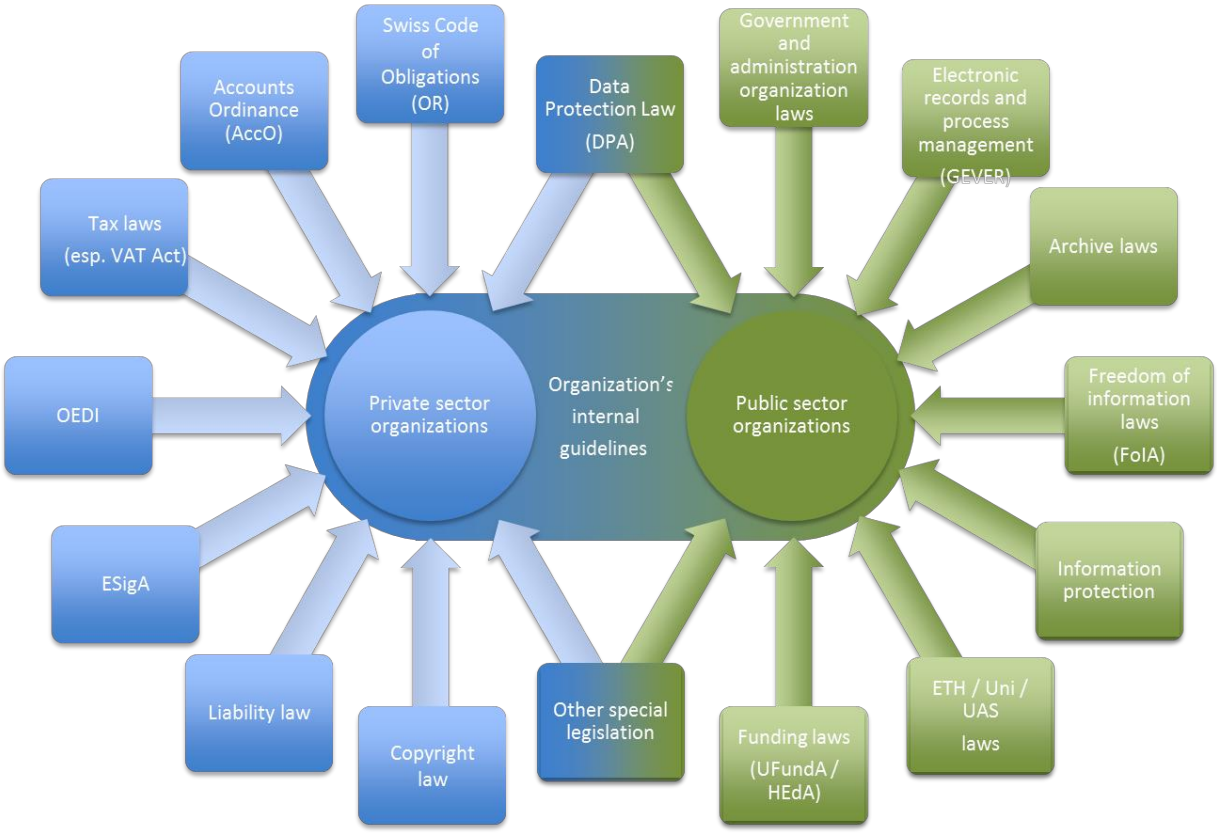

Figure 2: The legal bases of information management pursuant to [Siegrist]

- **Swiss Code of Obligations:**
  - Federal Act of March 30, 1911, on the Amendment of the Swiss Civil Code (Part Five: The Code of Obligations) (SR 220); in particular Division One: Obligations arising by Contract and Division Four: The Commercial Register, Business Names and Commercial Accounting [OR]
- **Accounts Ordinance:**
  - Ordinance of April 24, 2002, on the Maintenance and Retention of Accounts (SR 221.431) [AccO]
- **Tax laws:**
  - Value Added Tax Act: Federal Act of September 2, 1999, on Value Added Tax (SR 641.20) [VATA]
  - Value added tax ordinance: Ordinance of March 29, 2000, on the Federal Act on Value Added Tax (641.201) [VATO]
  - Various cantonal tax laws
- **OEIDE**
  - FDF Ordinance of January 30, 2002, on Electronic Data and Information (SR 641.201.511) [OEDI]
- **ESigA:**
  - Federal Act of December 19, 2003, on Certification Services in relation to Electronic Signatures (SR 943.03) [ESigA]
- **Liability law:**
  - Code of Obligations, Division One, Section Two: Obligations in Tort [OR]
  - Other laws on liability (including liability resulting from organizational form)
- **Copyright law:**
  - Federal Act of October 9, 1992, on Copyright and Neighbouring Rights (SR 231.1) [CopA]
- **Data protection law:**
  - Data Protection Act: Federal Act of June 19, 1992, on Data Protection (SR 235.1) [DPA]

  - Ordinance on the Data Protection Act: Ordinance of June 14, 1993, to the Federal Act on Data Protection (SR 235.11) [DPO]
- **Government and administration organization laws:**
  - Federal Act of March 21, 1997, on the Organization of Government and the Administration (SR 172.010) [GAOA]
  - Ordinance of November 25, 1998, on the Organization of Government and the Administration (SR 172.010.1) [GAOO]
- **GEVER:**
  - Ordinance of November 30, 2012, on Electronic Records and Process Management by the Federal Administration (SR 172.010.441) [GEVER]
- **Archive laws:**
  - Federal Act of June 26, 1998, on Archiving (SR 152.1) [ArchA]
  - Ordinance of September 8, to the Federal Act on Archiving (SR 152.11) [ArchO]
  - Various cantonal archiving laws
- **Freedom of information laws:**
  - Federal Act of December 17, 2004, on Freedom of Information in the Administration (SR 152.3) [FoIA]
- **Information protection:**
  - Ordinance of July 4, 2007, on the Protection Federal Information (SR 510.411) [InfoPO]
  - Ordinance of December 9, 2011, on Information Technology and Telecommunication in the Federal Administration (SR 172.010.58) [BInfV]
  - Various cantonal laws
- **Higher education laws:**
  - Federal Act of October 4, 1991, on the Federal Institutes of Technology (SR 414.110) [FIT Act]
  - Various cantonal higher education laws [HG_CRUS]
  - Federal Act of October 6, 1995, on Universities of Applied Sciences (SR 414.71) [UASA]
- **Laws on funding for universities and higher education institutions:**
  - Federal Act of October 8, 1999, on University Funding and Cooperation in the field of University Education (SR 414.20) [UFundA]
  - Ordinance of March 13, 2000, to the University Funding Act (SR 414.201) [UFundO]
  - Federal Act of September 30, 2011, on the Funding and Coordination of the Higher Education Sector t [HEdA]
  - Federal Act of October 7, 1983, on the Promotion of Research and Innovation (SR 420.1) [RIPA]
- **Special laws:**
  - Various other laws applicable to the fields of activity of the Swiss higher education sector.

In order that common services can be both offered and used, the national services which program SUC P-2 will be creating must satisfy all the legally relevant requirements.

As well as the legal bases, there are a multitude of Swiss, European and global standards and norms which may influence the implementation of national services.

The above list is not exhaustive. The detailed specifications will thoroughly assess the legal bases and the standards and norms which must be met, in relation to specific aspects of the implementation of the program.

1.3 Objectives

The following sections explain the objectives of program SUC P-2 “Scientific information: access, processing and safeguarding” and of this document.

1.3.1 Objectives of program SUC P-2

The focus of this program is to provide researchers, teachers and students at Swiss higher education institutions with an optimal environment for the use (search, consultation, processing, visualization, storage, dissemination, sharing, reuse) of all forms of scientific information needed for their work.

Program SUC P-2 is designed to take into account the needs of researchers, teachers and students by offering services that meet these needs in an optimal manner, by making the best use of technological advances and respecting the legal constraints regarding the rights of access and data protection, while also taking into consideration the limited means available to the higher education institutions.

This presupposes, on the one hand, taking account of the specific needs of the various disciplines and institutions, and on the other hand bringing together the skills and know-how of the different sectors involved in an approach focused on user services, while also making the best use of existing networks at national level.

Another factor that is essential to the success of Program SUC P-2 is the use of appropriate cost control and financing mechanisms.

A national strategy will be developed for the development and sharing of infrastructures, resources and services related to scientific information.

To determine the framework and direction of the planned activities during the period 2013-2016, Program SUC P-2 is based on a generic model of the needs of researchers, teachers and students as far as scientific information is concerned.

According to this model, scientists must:

- have transparent and secure access to research results (e.g. publications, databases) relevant to their work as well as to such available information and data that are relevant to their work (e.g. texts, survey results)
- be able to store and keep data generated in the course of their work in order to access, exchange or distribute such data
- be able to access, in a secured and transparent manner, available resources for the processing of information necessary for their work.

1.3.2 Aim of this document

The aim of this document is to lay the groundwork for a strategy paper. Its contents can be illustrated as follows:

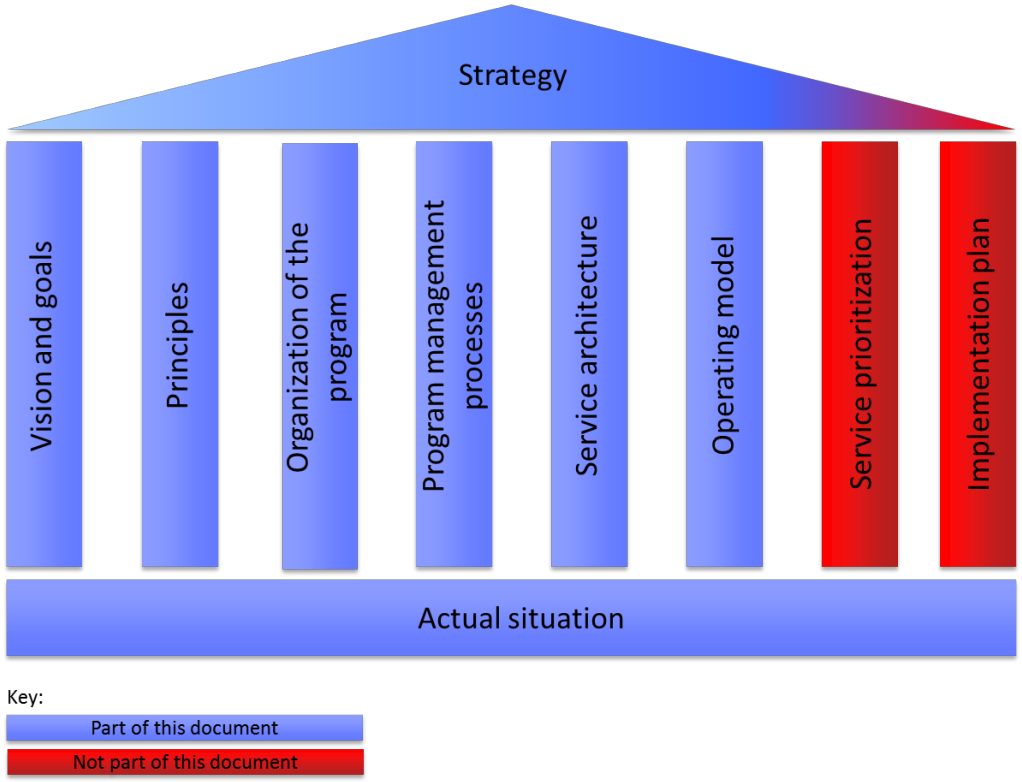

Figure 3: Illustration of the content of this document

Actual situation: Gauging the current situation by means of use cases, which will form the basis for ascertaining needs and the current projects and services.

Vision and goals: As the basis for the program, the program's guiding vision and principles for its entire duration will be defined.

Principles: Identifying and describing the principles which serve as guidelines for the program.

Organization of the program: Description of the program's organization and the necessary roles.

Program management process: Definition of the fundamental management processes for managing the program over its entire duration. The program management process is subdivided into steering, management and financing.

Service architecture: Illustration of the national services with a strategic service architecture which is derived from the use cases and based on the functional architecture.

Operating model: Description of the possible alternatives for implementing national services.

Service prioritization: Prioritization of the identified services with regard to their implementation.

Implementation planning: Finalization of implementation planning based on the prioritized services.

Strategy: The strategy encompasses all the aspects outlined above.

1.4 Scope

1.4.1 Scope of the program

The task of the SUC P-2 program is to establish Switzerland's needs as a research center in regard to scientific information, prioritize those needs and allocate the financial resources received by the SUC in accordance with the priorities set.

The organizations at which the program is aimed will decide whether to cooperate with the development of, and use, the services to be established by the Program SUC P-2 .

This program is aimed at the following organizations:

- **Cantonal universities:**

The universities of Basel, Berne, Fribourg, Geneva, Lausanne, Lucerne, Neuchâtel, St. Gallen, Italian-speaking Switzerland and Zurich.

- **ETH institutions (Swiss Federal Institutes of Technology):**
  - The two ETH and four research institutes
- **Universities of applied sciences:**
  - All seven public universities of applied sciences
- **Other institutions eligible for grants under the UFundA:**
  - The SUC P-2 program is open to all those institutions that are eligible for grants according to the UFundA (IHEID, IDHEAP, IUKB, FS Schweiz) and which contribute their own funding or services.
- **Other partners:**
  - Universities of teacher education
  - Certain partners such as SWITCH, the library network, or the National Library will undoubtedly have an important role to play within the framework of this program, without their being attached to a university, an ETH institution, or another Swiss higher education institution.
  - The program is open to other partners (e.g. institutions as per Art. 16 [RIPA], Federal Archives) which contribute their own funding or services.

1.5 Delimitation

1.5.1 Delimitation of the program

The program is limited to the tasks described in the program request [PRG_P2-A]. The program is intended only for the organizations listed in section 1.4.1.
Projects and services that bear no relation to scientific information will not be considered.

1.5.2 Delimitation of the document

This document has been prepared within the context of Phase 1 of this program and lays the groundwork for the strategy. It neither prioritizes the function blocks and services identified nor contains any details regarding their financing.

1.6 Efforts abroad

Annex A, International Efforts, contains a list of selected international projects which pursue similar aims to those of Program SUC P-2.

2 Strategic focus

2.1 Vision

By providing national services in the sphere of access to and the processing and safeguarding of scientific information, the aim is to make tools available to Switzerland's education and research organizations that will enable them to continue spearheading the field of education and research and fulfill the legal requirements.

2.2 Principles

The guiding principles[1] for the entire program are:

- All national services are listed in a Service Catalog, which is centrally managed and made available in electronic form to all academic users.
- Services can be provided centrally or using a decentralized system.
- Existing services will be used wherever possible. If necessary, these services will be expanded in order to provide a national service.
- The services are easy, intuitive, efficient and effective to use.
- Only services which meet the needs of education and research will be implemented.
- The services will be made available to all the organizations listed in section 1.4.1, and can therefore be used throughout Switzerland.
- The shared services will enable cost optimization.
- The sustainability of the services is of vital importance.
- The entire life cycle of scientific information will be covered by the services available.
- The legal constraints will be observed. When the appropriate bases are missing, the program must initiate their creation.
- The services are guided by national and international standards and best practices.
- There is central governance with clearly defined interfaces and standards.
- The services will be made available through defined interfaces and standards in order that they can be used autonomously by the organizations.

2.3 Fields of activity

The request for Program SUC P-2 defines and describes in detail the following fields of activity [PRG_P2_A]:

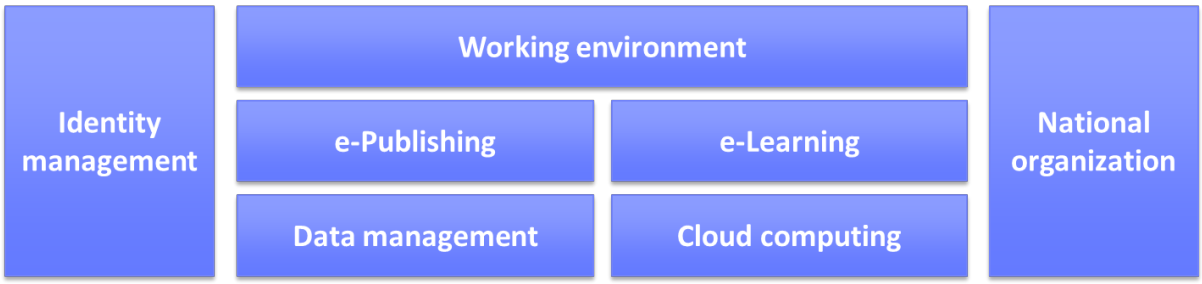

Figure 4: Illustrative overview of the fields of activity

[1] The list of guiding principles is not in any order of priority.

The following subsections briefly summarize the content of the fields of activity.

2.3.1 Identity management

An infrastructure for identity management at national level to ensure that students, teachers and researchers not only have access to data to which their current status entitles them, but also lifelong access to their personal data (certificates, diplomas, e-portfolio, research results, etc.).

2.3.2 Working environment

Integration of different services in personalized and ergonomic virtual environments to support the work of researchers, teachers and students.

2.3.3 e-Publishing

Licensing for electronic documents (current publications and “back-file archives”), digitization and presentation of historical documents, implementation of an open access policy.

2.3.4 e-Learning

The infrastructure necessary for education based on electronic means, in particular mobile platforms, personal learning environments, e-portfolio, e-assessment and open educational resources.

2.3.5 Data management

Access to, management, exchange and storage of research data and educational material (metadata, life-cycle data, permanent archiving).

2.3.6 Cloud computing

A shared infrastructure made available with infrastructure as a service, and with software as a service to respond in a flexible manner to the massive needs for the processing and storage of data in all scientific disciplines.

2.3.7 National organization

This field of activity creates a robust, structured organization for the program. The national organization permits the groundwork to be laid for a coherent strategy and the transition beyond the program to be well managed. It will also create a management framework which ensures that the different projects set up contribute towards this strategy and deliver the results expected by the scientific community. The national organization will also ensure that it makes full use of all possible synergies to avoid duplication, and will pay particular attention to cost control. It will also ensure the dissemination and outreach of the program, so that the scientific community is made aware of what it can offer.

2.4 Stakeholders (context diagram)

The various parties involved and stakeholders with regard to scientific information can be illustrated as a context diagram.

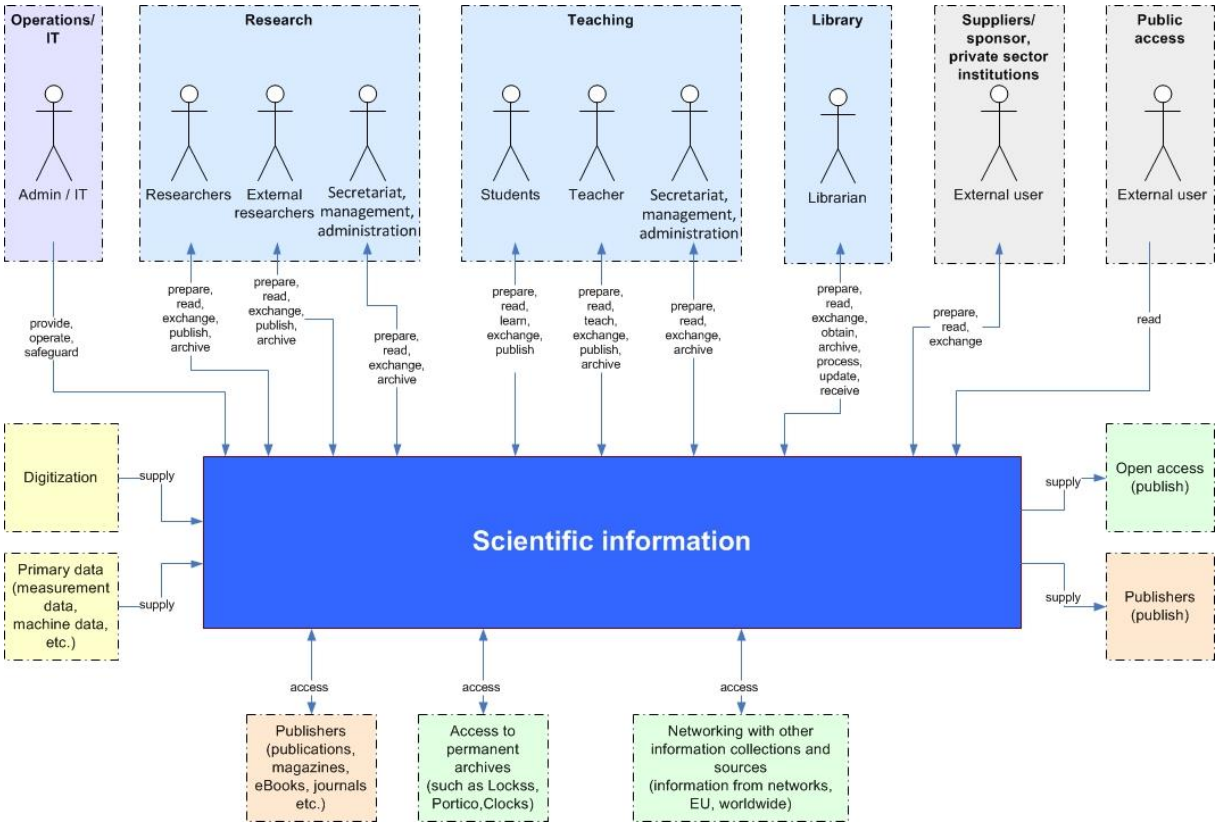

Figure 5: Stakeholders for scientific information (context diagram)

3 The program

3.1 Organization of the program

The following sections illustrate the organization of the program in Phase 1 and describe the possible organization for the remainder of the program.

3.1.1 Organization of the program in Phase 1

In Phase 1, the program organization (cf. Figure 6) comprises the Steering Committee (SC), the Program Management (including secretariat), the CRUS Core Team and the representatives of the fields of activity.

The relevant organizations identified by the CRUS during the program start-up phase are grouped by fields of activity. Each organization has made representatives and employees available to the program for the management of Phase 1.

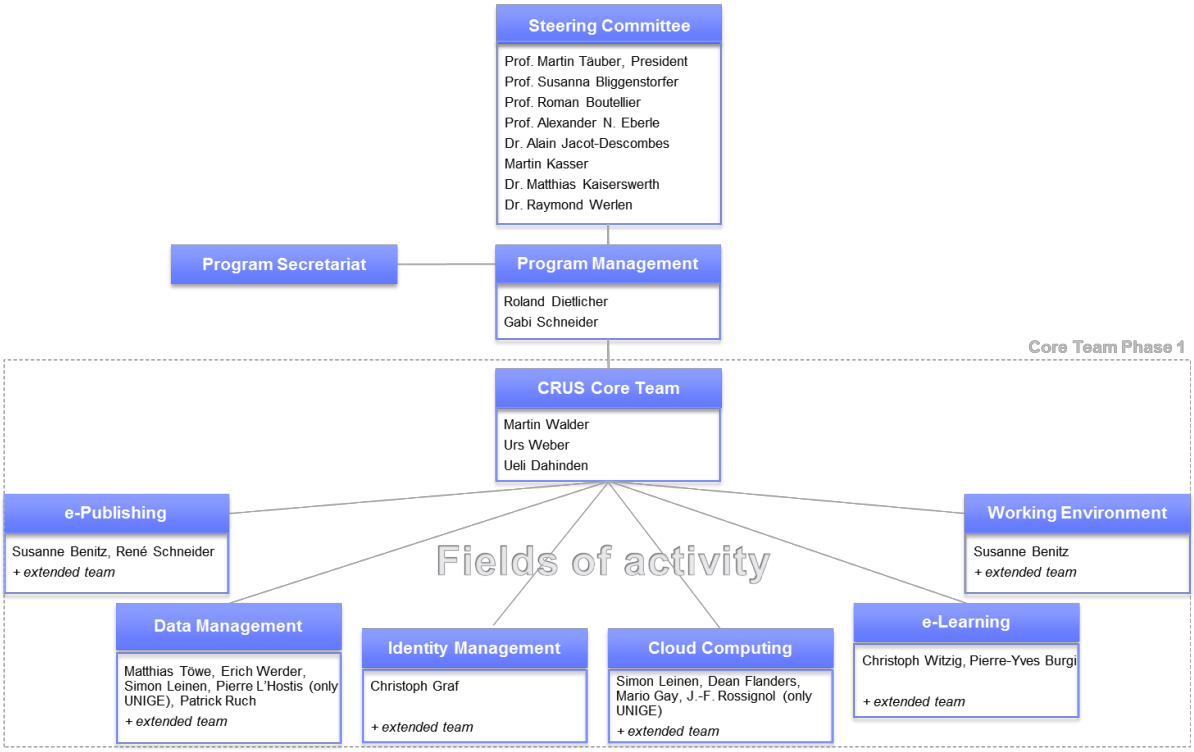

Figure 6: Program organization in Phase 1

3.1.2 Proposed organization of the program beyond Phase 1

The Steering Committee and the Program Management will continue to fulfill the same functions for the remainder of the program. The CRUS Core Team from Phase 1 and the representatives of the fields of activity will no longer be available in their current form after Phase 1.

In addition, an Expert Committee will be required in order to assess the professional requirements, an Architecture Committee to assess and define the technical facilities and a Project Management to realize the actual implementation projects.

The implementation projects entail the implementation of services, the creation of an operational structure and the definition of expert committees/groups to realize non-technical solutions. The service

providers that are responsible for operating the services created will also be incorporated in the organization of the program, although how they will be incorporated has yet to be finalized and depends in particular on the chosen operating model (cf. Section 6).

The roles and responsibilities of the individual organizational units are explained in more detail in Sections 3.4 and 6.

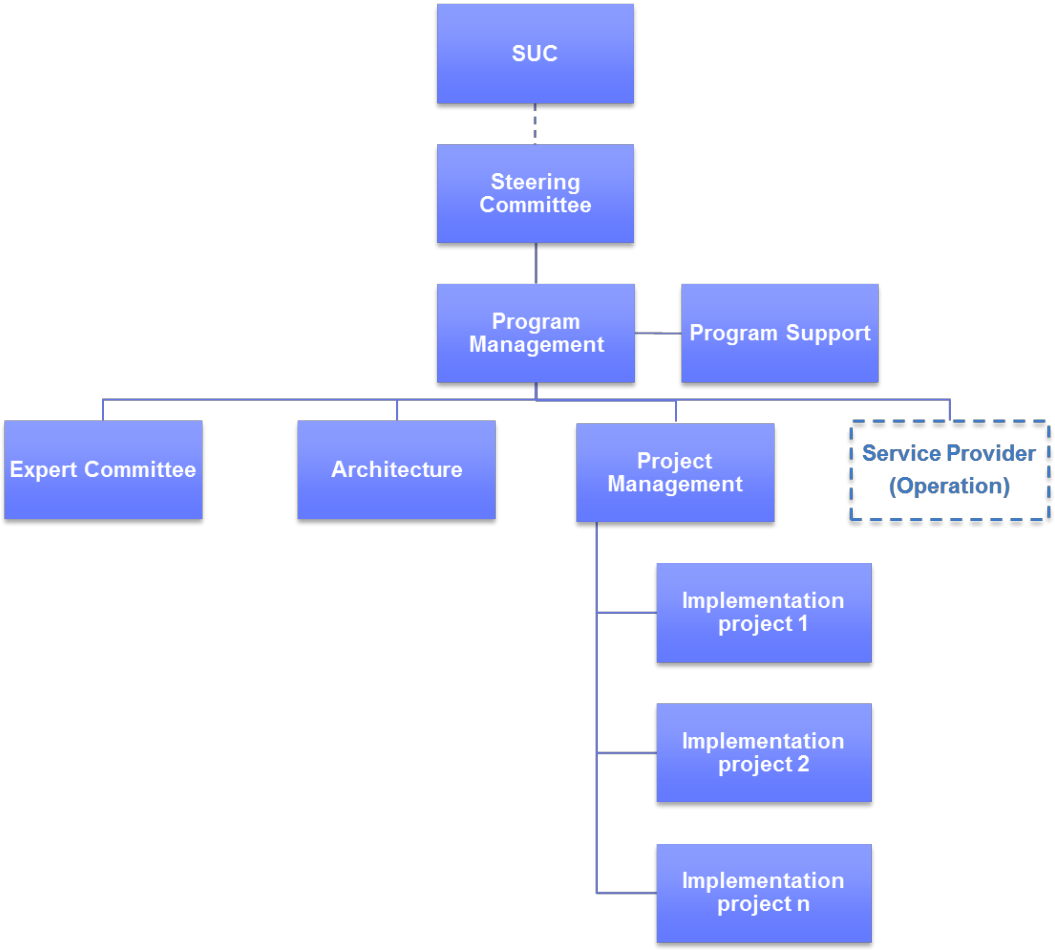

Figure 7: Proposed program organization beyond Phase 1

3.2 Action strategy

The program is divided into a strategy and a realization phase. The strategy is in turn split into two sub-phases.

- Strategy: Phase 1 (“Foundations for the strategy,” this document)
  - Assessment of the fields of activity
  - Defining the stakeholders
  - Ascertaining needs by means of use cases
  - Creating the functional and service architecture
  - Establishing the bases for organization, processes and services
- Strategy: Phase 2
  - Establishing the program management
  - Prioritizing the national services
  - Allocation to implementation projects and implementation planning
  - Drawing up the investment plan
  - Finalizing and submitting the strategy (white paper)

- Realization phase (implementation projects)
  - Setting up the necessary organizations (operations, expert committee, expert groups etc.)
  - Setting up and realizing the actual national services
  - Continual review of existing services and integration of new requirements

Figure 8 below illustrates the flow chart for the program over the entire financing period (2013-2016).

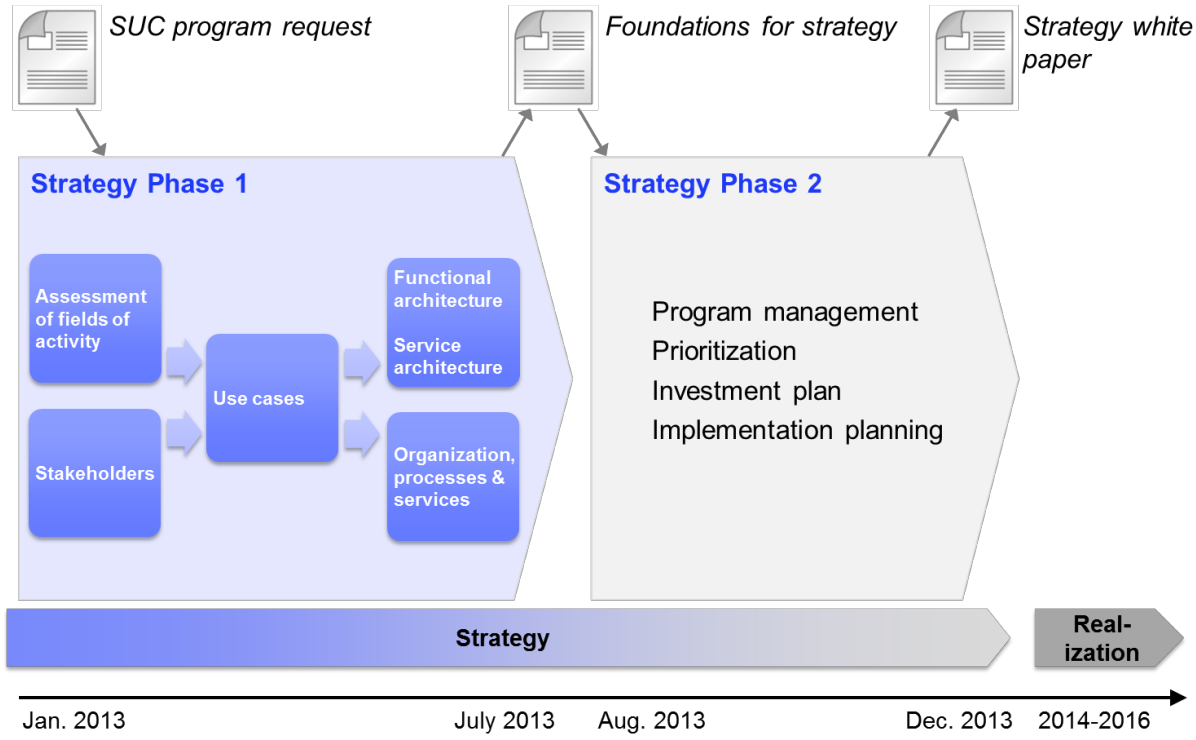

Figure 8: Program flow chart for SUC P-2

3.3 Elements of the program

The action strategy defines the following elements that are needed for the cohesive, centrally coordinated execution of the program. The elements form the basis for the program management process.

Element	Description
Use case	The purpose of use cases is to ascertain professional needs, existing requirements (actual situation) and new requirements. These are ascertained using a structured template (cf. Annex B).
Function block	The requirements are described in function blocks, derived from the actual situation and the recorded use cases. The function blocks are clearly delimited areas which describe functionalities and tasks when handling scientific information. The function blocks form the basis for the functional architecture and cover all the functional requirements.
National services	The service view is derived from the strategic focus and the functional architecture. It forms the basis for the national services which are to be made available in the future in the scientific sphere.

Element	Description
Project portfolio	The prioritized national services are allocated to various implementation projects and included in the project portfolio. Project requests are prepared and approved for the implementation projects. Finally, the implementation projects are undertaken and managed in the program.

Table 1: Elements of Program SUC P-2

3.4 Program management process

The program management process regulates the implementation of the program over its entire duration and defines the various tasks and responsibilities.

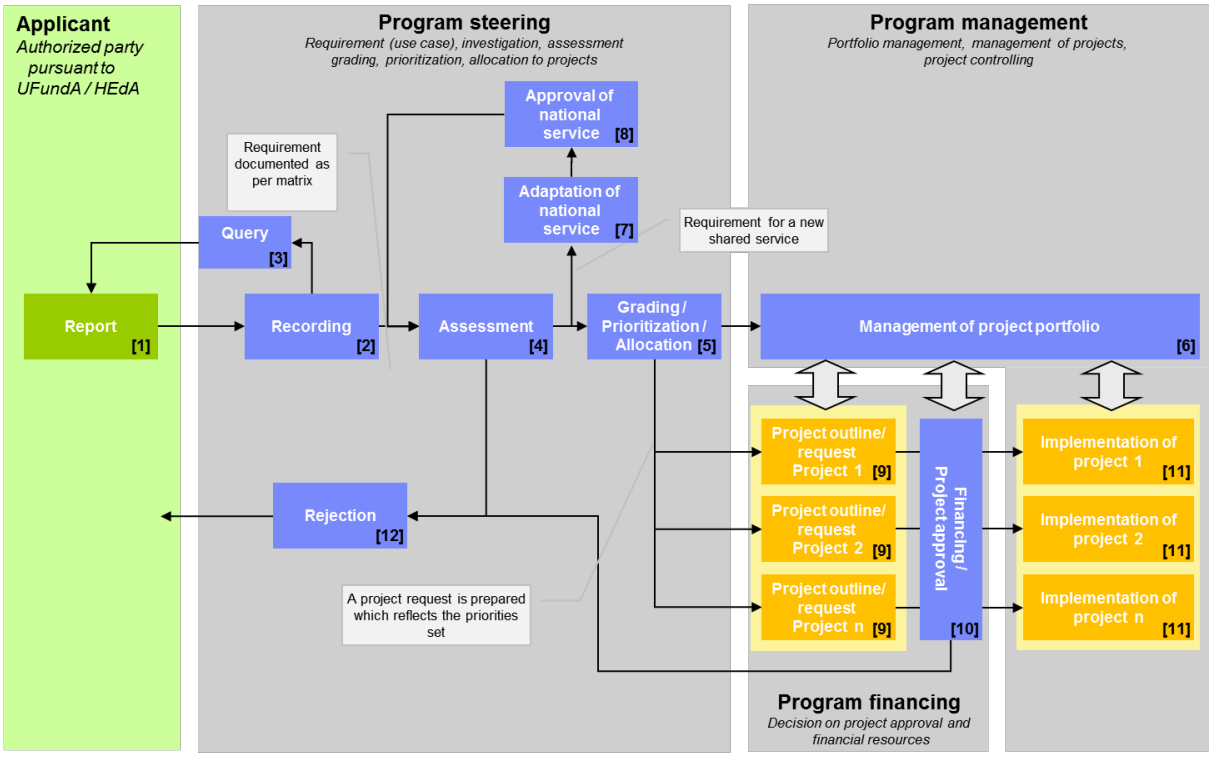

Figure 9: Program management process

Table 2 below describes the tasks and the possible staffing of the roles involved in the program management process.

Role	Tasks	Staffing
Applicant	Assembles requirements and needs in the context of scientific information for the purposes of the program and is the contact person for the respective stakeholders for the program.	▪ Representatives of the respective institution ▪ Contact persons for the respective stakeholders/fields of activity

Role	Tasks	Staffing
Program management	Management of the program and general contact person for the program. Manages and is responsible for the Steering, Financing and Management components of the program. Delegates tasks to the program support and project management. Acts as liaison with the Steering Committee and reports on the program status.	▪ As per section 3.1
Program support	Supports the program and the program manager, handles program tasks and undertakes those tasks autonomously. Ensures and coordinates financing and communication. Is responsible for administrative program tasks.	▪ Two to four people who report to the program management during the program
Expert Architecture Committee	Assesses professional needs and requirements in order to adapt the architecture and the national services. Makes recommendations for the Steering Committee on adapting the architecture/national services.	▪ Specialist representatives to be appointed by the Steering Committee (e.g. representatives/managers of the expert committees CBU/KUB, CBH/FHB, ETWG, ASIUS, FID, Switch)
Steering Committee	Steers and guides the program, assesses opportunities and risks in the wider context. Is the program's decision-making body.	▪ As per Section 3.1
SUC	Is the Program SUC P-2 commissioning authority. Approves the financial resources.	▪ SUC organization
Project management	The project management is appointed on the recommendation of the Steering Committee for each defined project. The project management is responsible for preparing the project outline/project request and for implementation. Reports regularly to the program management on the project status.	▪ To be decided: A project management team is appointed for each implementation project
Service provider	For each national service to be implemented, the Steering Committee appoints a service provider on the recommendation of the program management. The service provider is responsible for the constant provision of the national service.	▪ To be decided: A service provider will be appointed for the respective operating model ▪ The following are potential service providers: o universities, ETH, universities of applied sciences o Switch o other external service providers

Table 2: Roles in the program management process

Table 3 below allocates the responsibilities in the program management process according to the RACI model[2] [RACI] for the roles defined above:

Activity in program management process Key: *R: Responsible* *A: Accountable* *C: Consulted* *I: Informed*	**Description**	**Applicant**	**Program management**	**Program support**	**Expert Architecture Commit.**	**Steering Committee**	**SUC**	**Project management**	**Service provider**
Report [1]	An organization that is authorized pursuant to the UFundA/HEdA sends a written report to the program for each request form (use case) in order to submit a requirement or a need.	R							
Review [2]	The submitted report is checked for completeness and clarity.		R, A	R					
Query [3]	If anything in the submitted request is unclear, it is queried with the applicant.			R					
Assessment [4]	The request is assessed on the basis of the requested functional requirements. The use case is also assessed to ascertain whether it is within the defined strategic fields of activity. The extent to which the request can be met with the strategic architecture in place, whether the defined function blocks cover the requirements submitted or whether a new function block is needed is also investigated. If requirements are set which, from a strategic perspective, necessitate a justified expansion of the architecture and the national services, a submission for an adaptation to the architecture and services is initiated.		A, R	R	C				

[2] Cf. the RACI model description below the table.

Activity in program management process Key: *R: Responsible* *A: Accountable* *C: Consulted* *I: Informed*	**Description**	**Applicant**	**Program management**	**Program support**	**Expert Architecture Commit.**	**Steering Committee**	**SUC**	**Project management**	**Service provider**
Grading/ prioritization/allocation [5]	The defined national services are graded and prioritized by importance and urgency. The strategic projects are ascertained and allocated on that basis. The preparation of a project outline or project request is initiated and the project management is appointed. To this end, management activities commence in the project portfolio.		R	C	C	A		I	
Project portfolio management [6]	The various projects are managed and steered (through the medium of the project portfolio) in the request, financing and project approval and project implementation phases. The program management periodically reports to the Steering Committee on the program status.		A, R	R		I			
Adaptation of national service [7]	Sometimes, it is necessary to adapt the architecture and make changes to/supplement or redefine a national service, in response to altered or new requirements. The architecture and the service adaptation are assessed. A proposal and recommendation are drawn up and submitted to the Steering Committee.		C	C	A, R				
Approval of national service [8]	The Steering Committee decides on the adaptation of the architecture/national service and approves or rejects the adaptation.		I		C	A, R	I		
Project outline/ Project request [9]	A project outline/project request is drawn up, describing in particular the financial and organizational requirements applicable to the structure and modus operandi of the project.		A	C				R	
Financing/project approval [10]	The project submission is reviewed and, depending on the project, the project financing and operational financing (operating costs model and operational structure) are determined.		I			R	A		I
Implementation	The approved project is implemented, with		I	C				A,	I

Activity in program management process Key: *R: Responsible* *A: Accountable* *C: Consulted* *I: Informed*	**Description**	**Applicant**	**Program management**	**Program support**	**Expert Architecture Commit.**	**Steering Committee**	**SUC**	**Project management**	**Service provider**
of project [11]	the defined project organization. The status is reported to the program management on a regular basis. Preparations are made for the operational transfer of the project to the operational organization, which takes place on completion of the project.							R	
Rejection [12]	If a project request is not accepted for inclusion in the program portfolio, a reasoned rejection (confirmed by the Steering Committee) is sent to the applicant.		R		I	A			

Table 3: Description and responsibilities in the program management process

Key:

- **Responsible** – (performance responsibility), responsible for actually performing the activity. The person who is performing the activity or initiating its performance by other people. Interpreted as responsibility in the disciplinary sense.
- **Accountable** – (cost responsibility), responsible in the sense of “approving,” “permitting” or “signing.” The person who bears responsibility in a legal or commercial sense (also interpreted as responsibility from a cost center perspective).
- **Consulted** – (professional responsibility). A person whose advice is sought. Also interpreted as responsibility from a technical perspective.
- **Informed** – (right to receive information). A person who receives information about the progress or outcome of the activity or has the right to obtain information.

Note: Under the RACI model, just one person (role) should – as a rule – be accountable for each activity. However, several people can be *responsible, consulted* or *informed* for a particular activity. It is also possible for one person to be both *accountable* and *responsible* for an activity [RACI].

4 Use cases

The recording and evaluation of the use cases is the central element of the program. This will allow the requirements and the current situation with regard to scientific information in the Swiss university landscape to be captured. The method is described below.

The completed forms were analyzed and evaluated using a hybrid form of quantitative and qualitative content analysis.

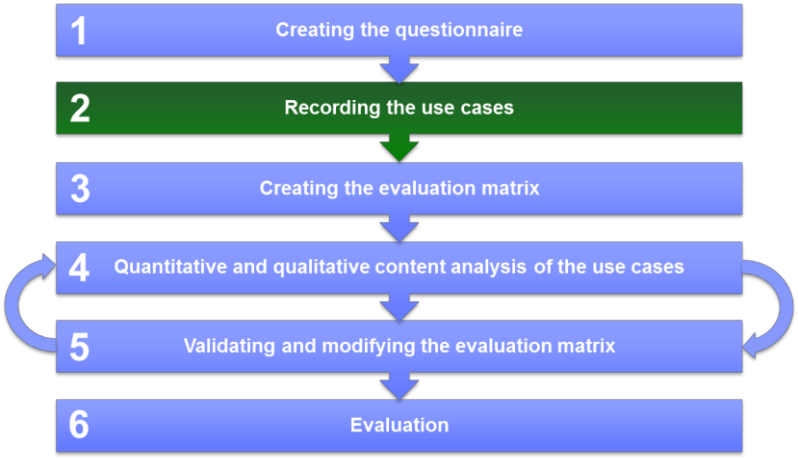

Figure 10: Method of evaluating the use cases

1. *Creating the questionnaire*
   The use cases are recorded using a questionnaire. This consists of a mixture of closed and open questions and is intended to be exhaustive, in other words, to allow all the possible content to be captured. The questionnaire includes general information about the origins of the use case, a brief description, the functionality required, the expected benefits and information about whether a project or service in this area already exists.
   The questionnaire is in Annex B.

2. *Developing/recording the use cases*
   The use cases were developed by those responsible for the fields of activity in the period from February to April 2013 (cf. Section 3.1.1).

3. *Creating the evaluation matrix*
   Designing the evaluation matrix and defining the analysis rules.

4. *Quantitative and qualitative content analysis of the use cases*
   Extracting the relevant sections of text into the evaluation matrix.

5. *Validating and modifying the evaluation matrix*
   During the analysis phase, the evaluation matrix will be validated and, if necessary, enhanced. If the evaluation matrix is modified, all the use cases must be processed again, so that all the data will have been evaluated using the same matrix. Therefore, points 4 and 5 should be seen as iterative steps.

6. *Evaluation*
   Presenting and interpreting the results.

4.1 Overview of the use cases

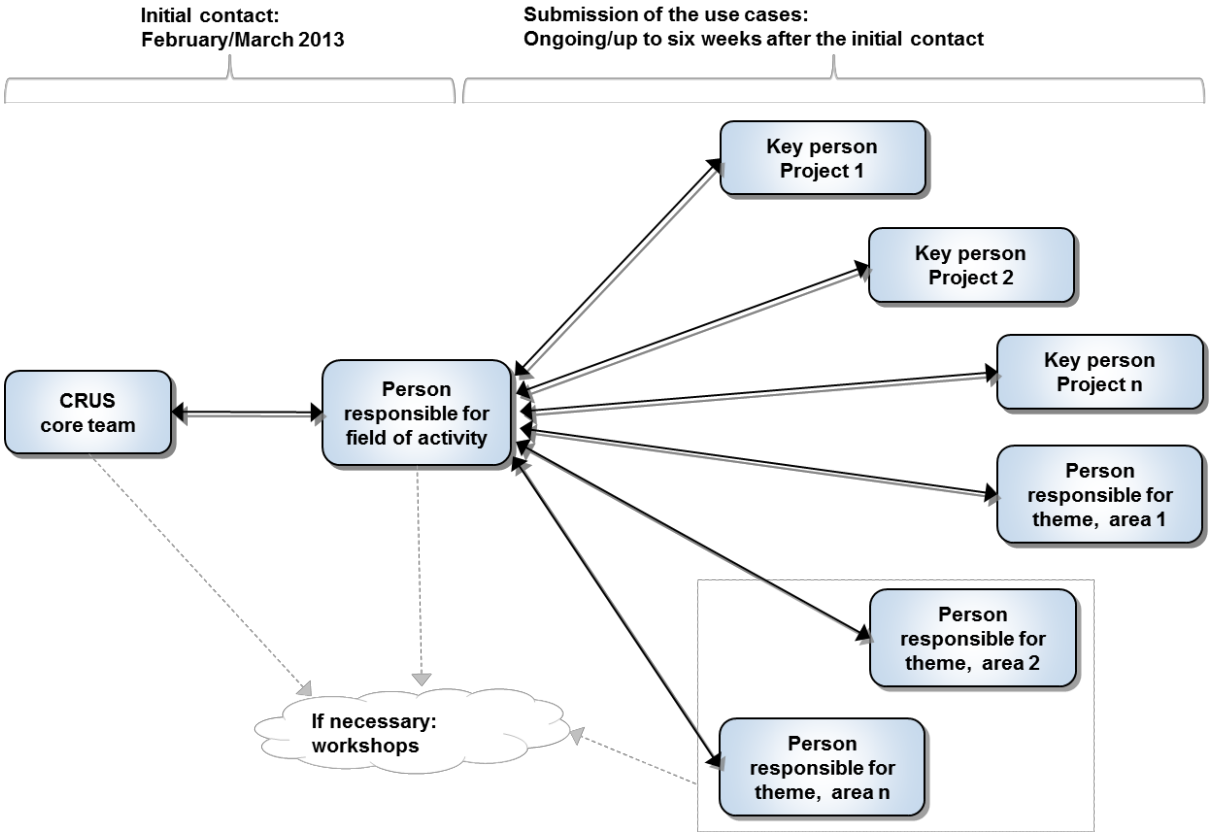

Figure 11: Procedure for recording the use cases

Around 159 people have submitted a total of 269 use cases via the 13 people with responsibility for the fields of activity. These use cases were then analyzed and evaluated. The evaluation described below dates from June 28, 2013.

The list of all the use cases received, which is sorted by the “Name of the submitter,” can be found in Annex C.

4.2 Quantitative evaluation of the use cases

Use cases per organizational unit
Question: “Which organizational unit does the use case originate from?”

Background: The person who completed the use case form was requested to specify the organization that the use case comes from. This question can have multiple answers.

Interpretation: The evaluation shows that almost all the institutions approached were directly involved in one or more use cases. This makes it clear that the procedure used to record the requirements is sufficiently wide-ranging.

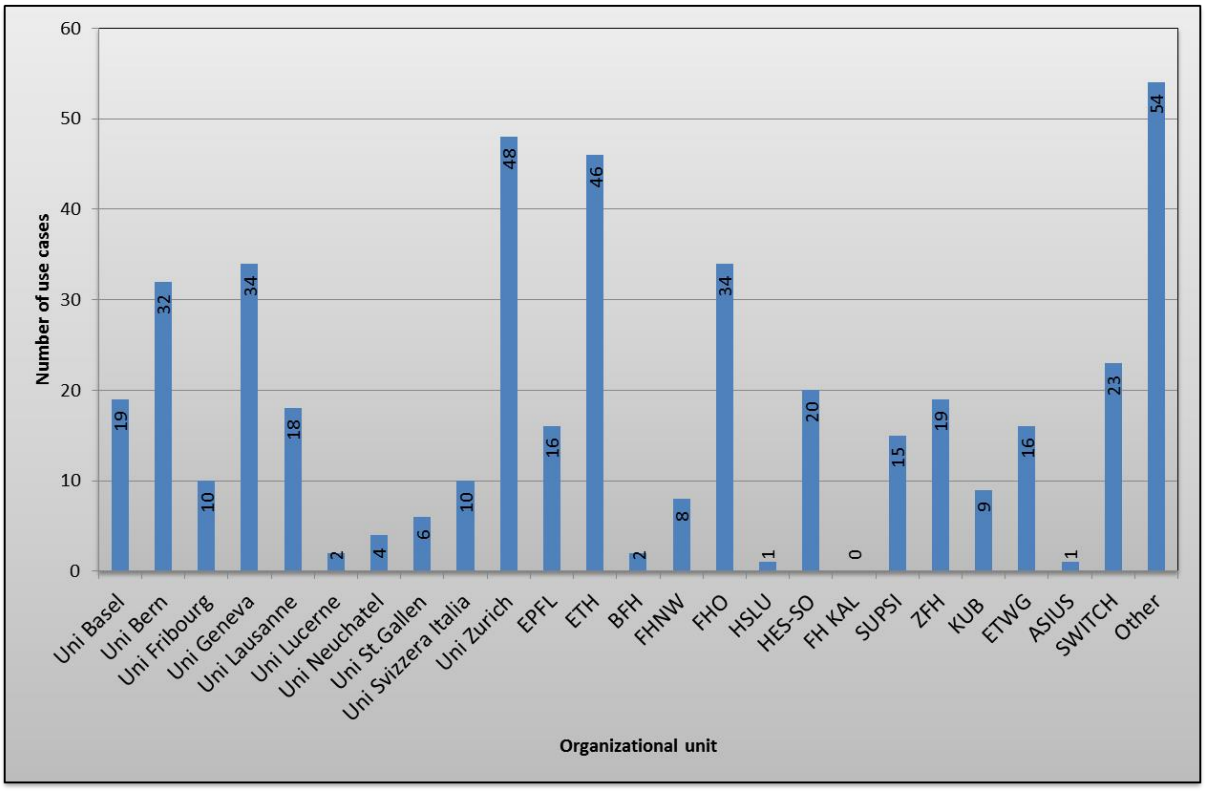

Figure 12: Quantitative evaluation – use cases per organizational unit

The following information, for example, is included under "Other": Paul Scherrer Institute PSI, SystemsX.ch/SyBIT Project, Swiss Institute of Bioinformatics (SIB), Friedrich Miescher Institute FMI, Swiss Institute of Particle Physics (CHIPP), Swiss Federal Court; Swiss Institute of Comparative Law, Zurich-Basel Plant Science Center (PSC), Swiss National Library, Swiss Academy of Humanities and Social Sciences SAGW, Working group on information literacy at Swiss universities (AGIK), SFDN (Swiss Faculty Development Network), researchers, etc.

Use cases per field of activity

Question: "Allocation of the use cases to the specified fields of activity." Depending on the main requirement, one or more could be selected.

Background: In this question the submitters were required to allocate their own use case to the fields of activity. The submitters could choose from the six specified fields of activity and there was also a text field for additional proposals. This question specifically permitted multiple answers. The blue bars show the use cases in which more than one field of activity was referred to. The red bars show the use cases in which only one field of activity was selected.

Interpretation: The majority of the submitters allocated their use case to more than one field of activity. This leads to the conclusion that the existing fields of activity should not be regarded as self-contained, but instead as fields with strong links that interact with one another.

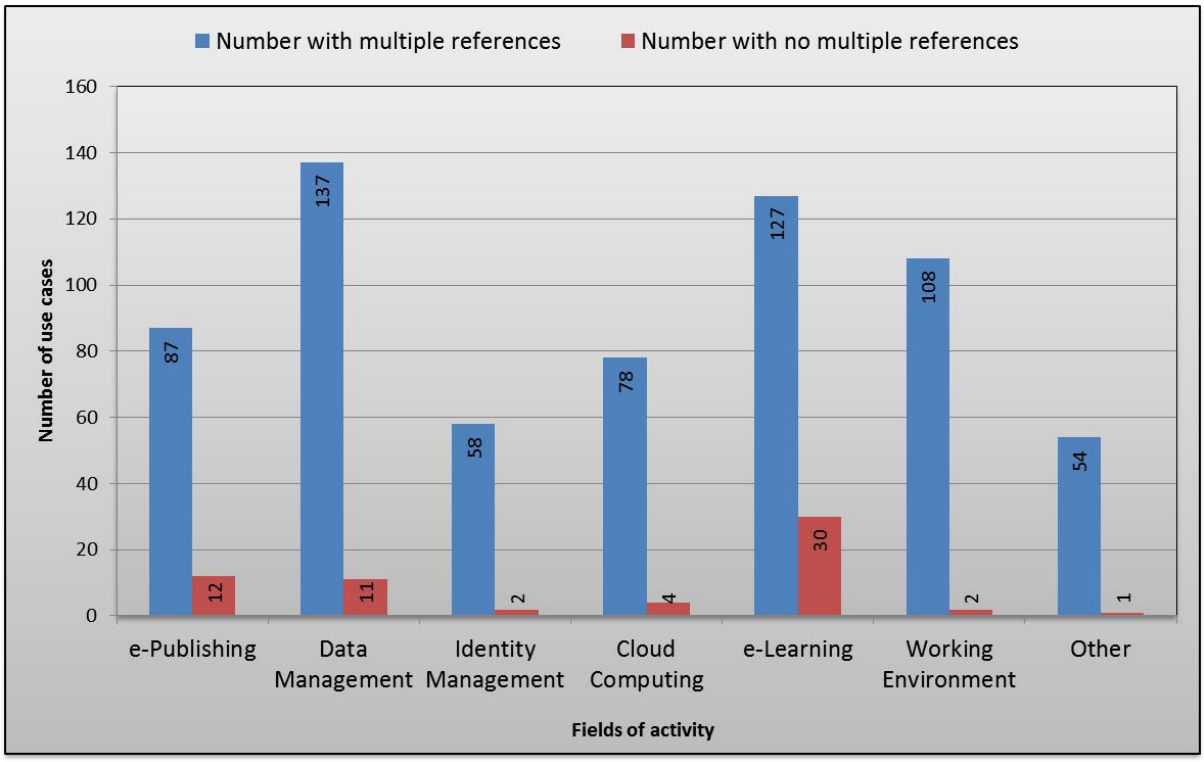

Figure 13: Quantitative evaluation – use cases per field of activity

The high number of use cases listed under “Other” was investigated in detail to see if other fields of activity could be selected. The analysis showed that the majority of the answers in the category “Other” either formed part of the existing fields of activity or were not part of this program.

Existing projects

Question: “Is there already a project for this use case in Switzerland?”

Background: This question is intended to identify existing projects. The light orange bar shows the number of use cases where there is already a project in this area. The darker orange bars indicate the project status. Multiple answers are possible for the status.

Interpretation: There is already a project for more than 40% of the use cases. It is not possible to conclude from this that the projects referred to cover the full functional scope of the use cases in question. However, the large number of existing projects indicates that these can be used as the basis for developing the national platform.

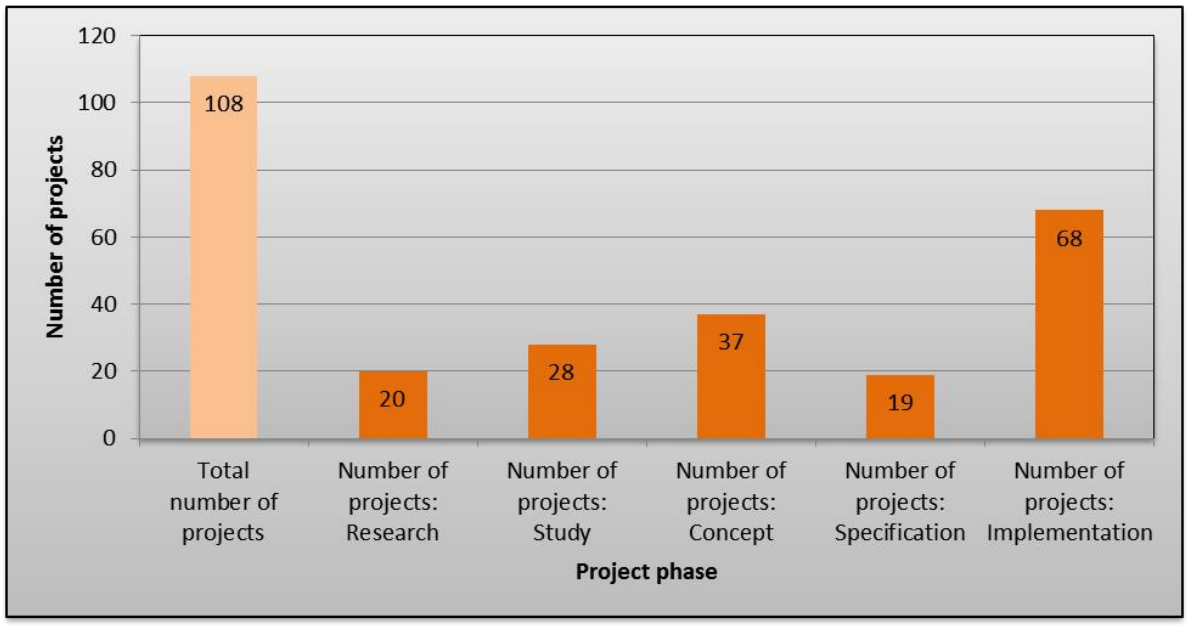

Figure 14: Quantitative evaluation – existing projects

Existing services

Question: "Is there already a service for this use case in Switzerland?"

Background: This question is intended to identify existing services. The light green bar shows the number of use cases where there is already a service in this area. The darker green bars indicate the service status. Multiple answers are possible for the status.

Interpretation: There is already a service for almost 30% of the use cases. It is not possible to conclude from this that the services referred to cover the full functional scope of the use cases in question. However, the large number of existing services indicates that these platforms can be used as the basis for developing the national platform.

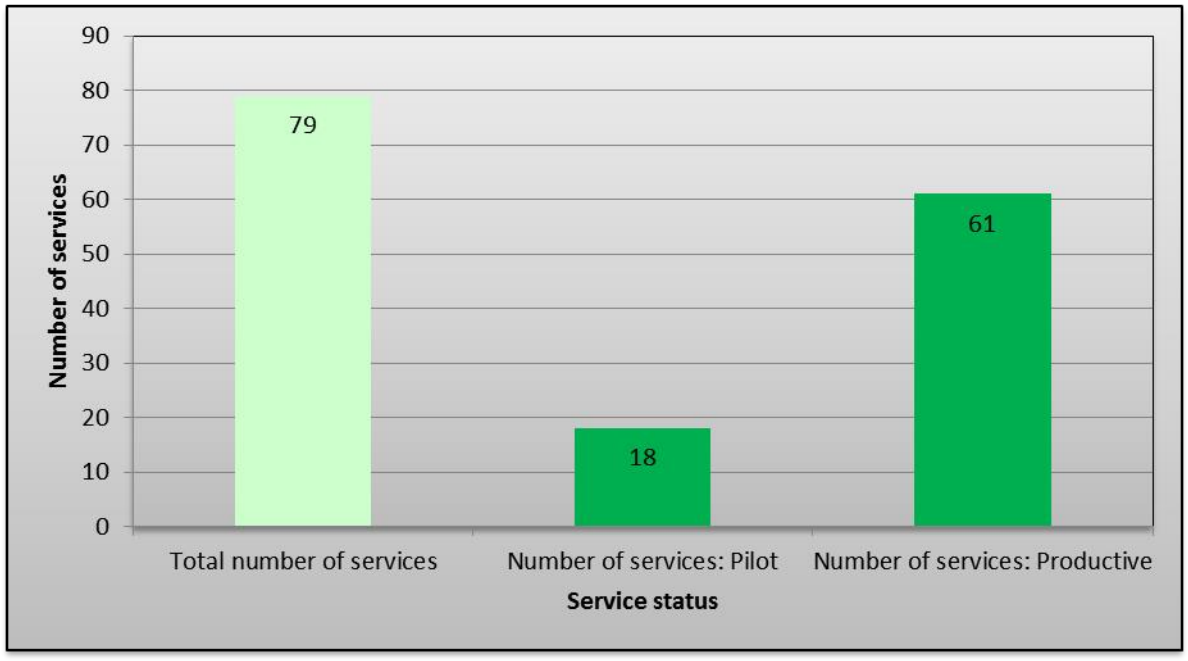

Figure 15: Quantitative evaluation – existing services

4.3 Analysis of the evaluation matrix

The following evaluations are based on the analysis of the matrix. This involved identifying the text blocks and allocating them to the accompanying categories/function blocks in the matrix (cf. Figure 16). The open questions "6. Brief description," "7. Objective," "8. Potential benefits" and "9. Main requirements" were used as the basis for the evaluation.

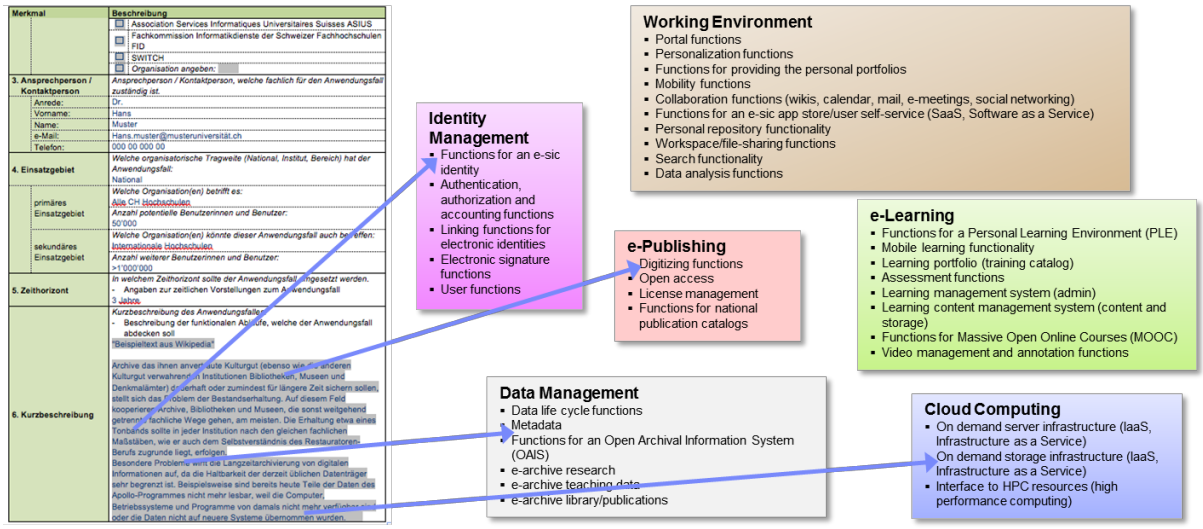

Figure 16: Allocating the text blocks to the accompanying categories in the evaluation matrix

Distribution of the use cases by area

Background: All the use cases were categorized according to their area of application. They were divided into the following categories: teaching, research, publication and "relates to all areas." Use cases which are relevant to all areas of a university were assigned to the category "relates to all areas." The use cases could be allocated to a maximum of two categories.

Interpretation: The evaluation shows clearly that all areas are well represented in this study.

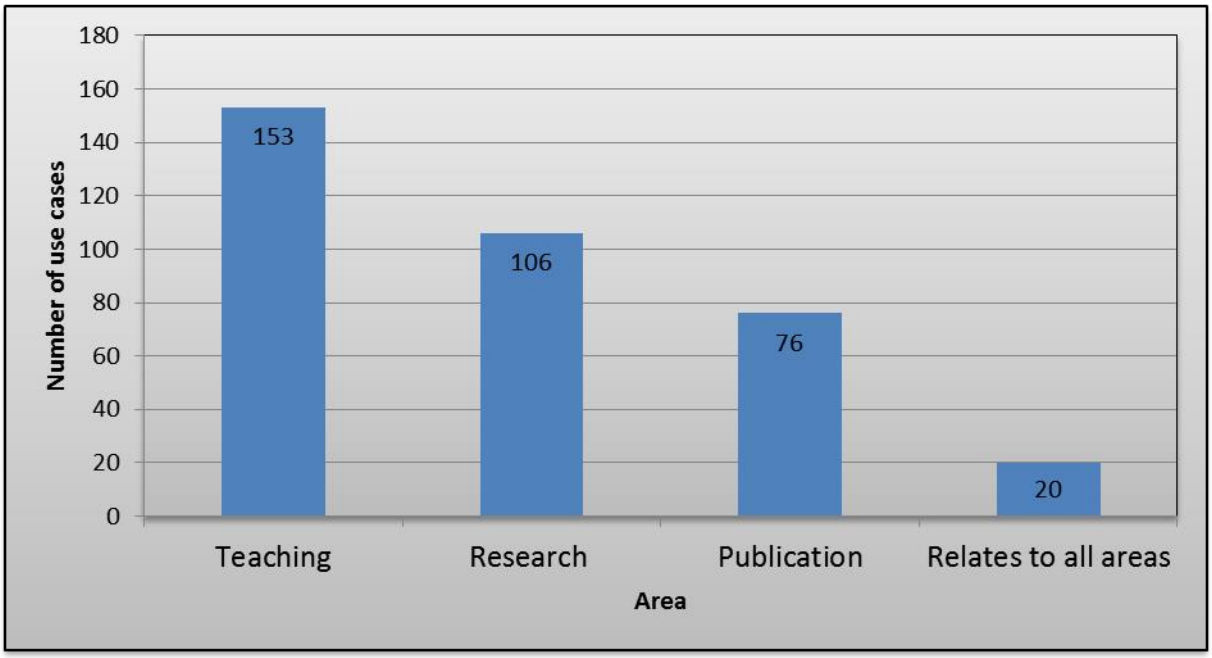

Figure 17: Use cases divided into areas

4.3.1 Functional requirements

Distribution of the use cases by field of activity

Background: The function blocks identified for each use case were transferred to the evaluation matrix. The function blocks in turn form part of the specified fields of activity (cf. Figure 16). The following evaluation shows the distribution of the use cases by field of activity.

Interpretation: In 136 of the 269 use cases there were functional requirements in the Working Environment field of activity. This can be explained by the fact that the requirements for online cooperation are grouped in this field of activity and a large number of the requirements submitted are based on this. The large number of entries (126) in the e-Learning field is due to the fact that there is already an active e-learning community in Switzerland in the form of the Educational Technology Working Group (ETWG)/Eduhub which the relevant use cases have specified.

Only a few use cases which belonged solely to the Identity Management field were submitted. However, many of the use cases are directly dependent on a national identity management solution so that they can operate on a national basis.

The detailed features of the components of the individual fields of activity will be explained more thoroughly in the following evaluations.

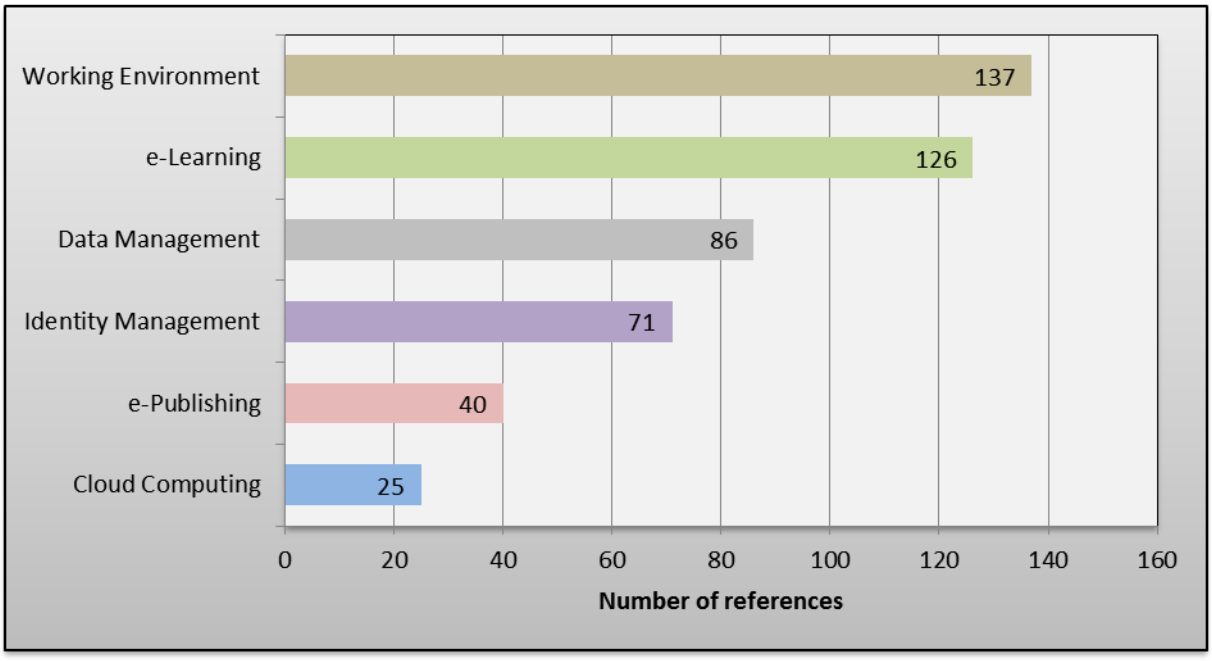

Figure 18: Distribution of the use cases by field of activity (on the basis of the functionality specified in the use cases)

Function blocks in the Working Environment field

Background: Figure 9 below shows the necessary function blocks in the Working Environment field. These requirements were extracted from the use cases by analyzing the questions “6. Brief description,” “7. Objective,” “8. Potential benefits” and “9. Main requirements.”

Interpretation: The majority of the requirements came from the area of online cooperation. This includes wikis, blogs, social media, online project rooms and other similar features. The required file-sharing functionality, which primarily concerns the exchange of data between individuals, is directly related to this. The call for an e-science (e-sic) app store is in line with the efforts to introduce national services. It should therefore be possible to access the necessary services from a list “with a single click of the mouse.”

A slightly simplified description of the personal portfolio is a résumé that is available online. In addition, the services should also be available on mobile devices. This is a result of their growing proliferation and importance.

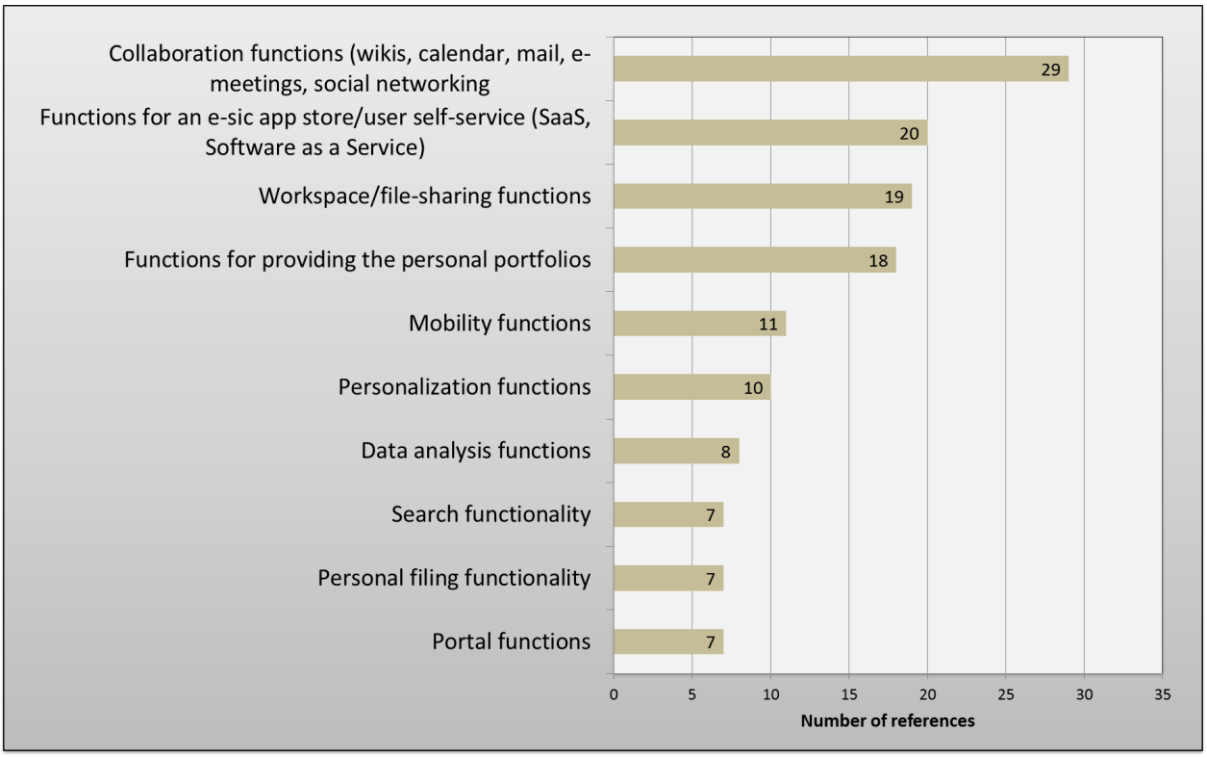

Figure 19: Function blocks referred to in the Working Environment field of activity

Function blocks in the e-Learning field

Background: Figure 20 below shows the necessary function blocks in the e-Learning field. These requirements were extracted from the use cases by analyzing the questions “6. Brief description,” “7. Objective,” “8. Potential benefits” and “9. Main requirements.”

Interpretation: The required functionality can essentially be grouped into three main categories. These are, firstly, the administration of the learning content and the courses, secondly, the provision and personalization of the learning content and the courses and, thirdly, the online test.

The services should also be available for mobile devices. However, it is important that existing services are not simply converted for mobile devices, but instead that active use is made of the new options that these devices offer (for example, developing interactive books instead of digitizing content).

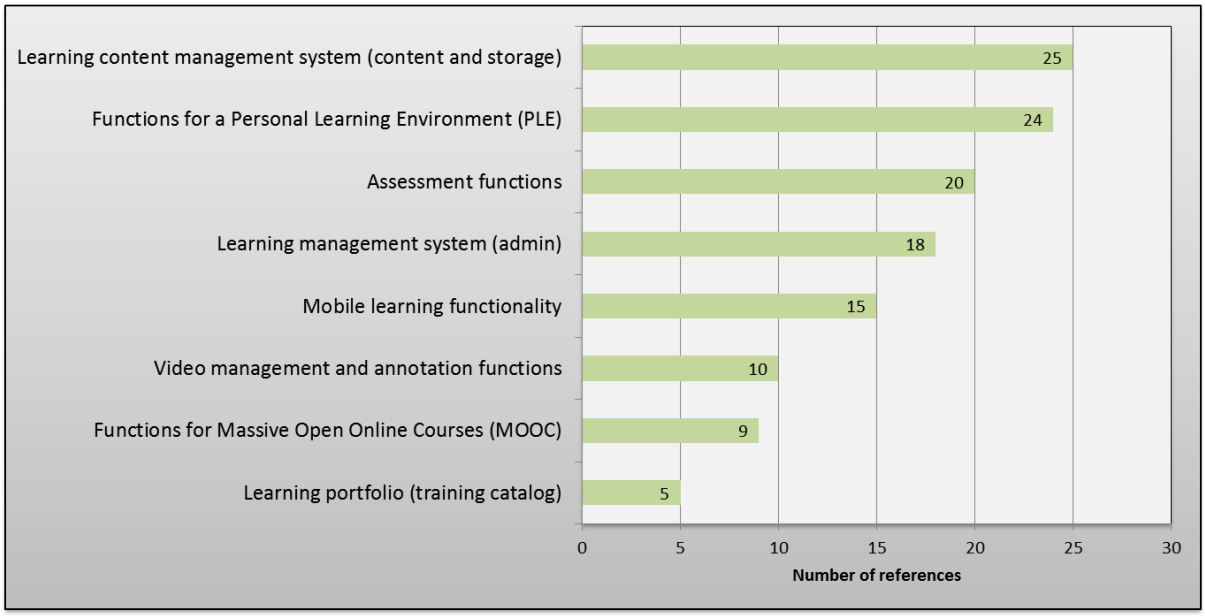

Figure 20: Function blocks referred to in the e-Learning field of activity

Function blocks in the Data Management field

Background: Figure 21 below shows the necessary function blocks in the Data Management field. These requirements were extracted from the use cases by analyzing the questions “6. Brief description,” “7. Objective,” “8. Potential benefits” and “9. Main requirements.”

Interpretation: The majority of requirements fall into the area of archiving research data (primary and secondary data). Some researchers still only store data on local or external USB hard drives. As a result, some research results have already been permanently lost following technical faults or staff changes. The libraries are responsible for digitizing collections and for the long-term storage of publications and the digitized collections. The data must be actively managed throughout the entire life cycle from creation through to deletion. If necessary, the data formats must be updated over time in order to guarantee that they can still be read.
The federalist approach taken by the Swiss university landscape means that uniform standards for metadata are needed so that the digital data can be shared.

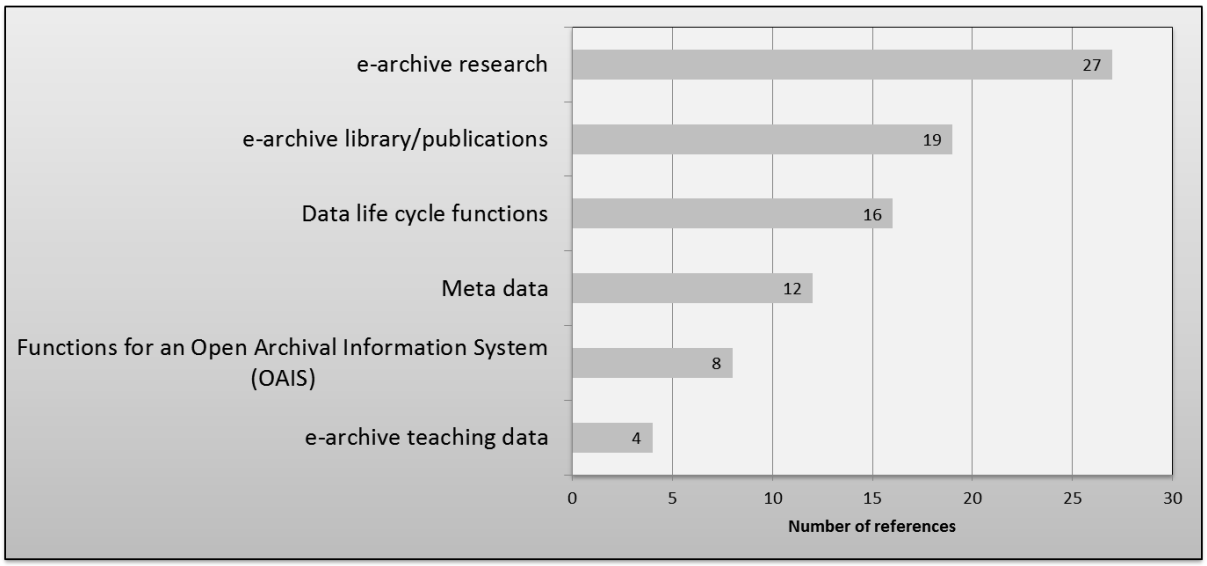

Figure 21: Function blocks referred to in the Data Management field

Function blocks in the Identity Management field

Background: Figure 22 below shows the necessary function blocks in the Identity Management field. These requirements were extracted from the use cases by analyzing the questions “6. Brief description,” “7. Objective,” “8. Potential benefits” and “9. Main requirements.”

Interpretation: Identity management is very important for national services. Without a comprehensive identity management function it is very difficult to implement services across different universities. The use cases submitted and, in particular, the first two function blocks with 28 and 27 references highlight this fact. The electronic signature function is required in several fields of activity in order to add an electronic signature to data and to allocate it beyond all doubt to one or more people.

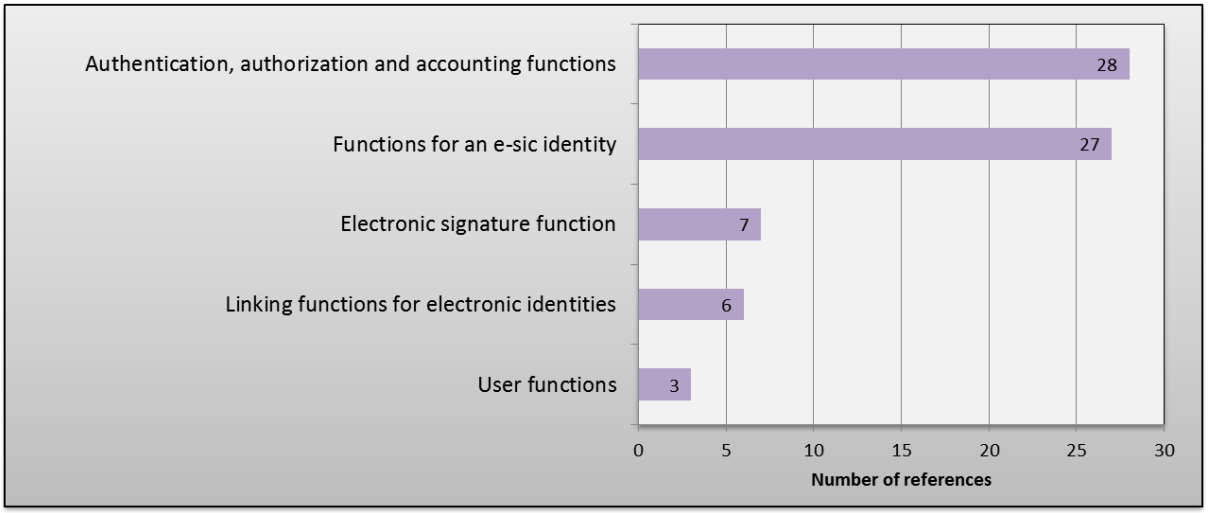

Figure 22: Function blocks referred to in the Identity Management field

Function blocks in the e-Publishing field

Background: Figure 23 below shows the necessary function blocks in the e-Publishing field. These requirements were extracted from the use cases by analyzing the questions “6. Brief description,” “7. Objective,” “8. Potential benefits” and “9. Main requirements.”

Interpretation: The subject of open access plays the leading role in the e-Publishing field with 15 references. Open access focuses on alternative publication options [OA] which supplement the traditional offerings of publishing houses.

The digitizing functions enable collections to be converted into a digital form (for example, scanning, full text interpretation). In the context of license management, the joint purchasing and management of publications was mentioned in particular. In order to allow Swiss universities to access publications in a central location (either via open access or documents published in the traditional way), comprehensive publication catalogs that are available on a national level are needed.

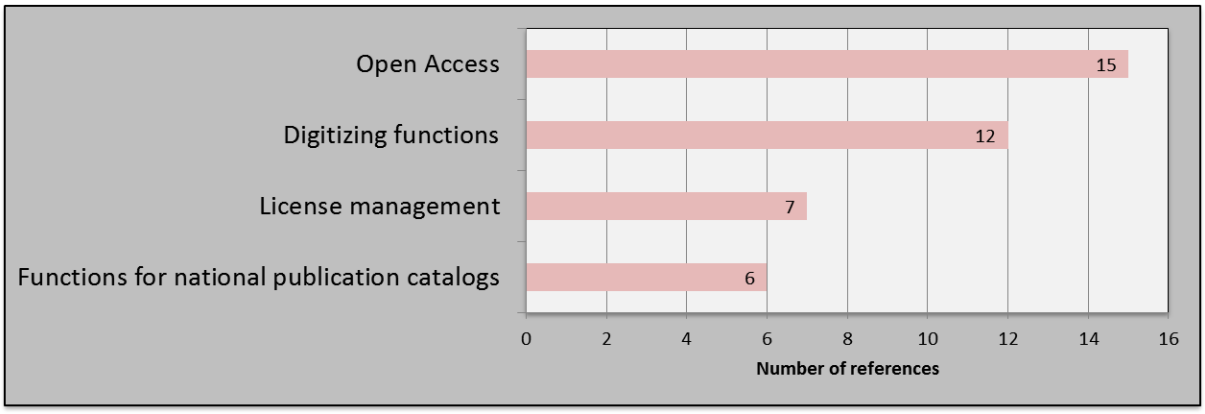

Figure 23: Function blocks referred to in the e-Publishing field

Function blocks in the Cloud Computing field

Background: Figure 24 below shows the necessary function blocks in the Cloud Computing field. These requirements were extracted from the use cases by analyzing the questions “6. Brief description,” “7. Objective,” “8. Potential benefits” and “9. Main requirements.”

Interpretation: The Cloud Computing field of activity includes functions which make resources available to the service user for a specific period of time. Generally, a distinction is made between two different categories: on the one hand, resources from server infrastructures (for example, computing power) and, on the other hand, storage resources. As high-performance computing is not a direct part of this program, only the interfaces to it are referred to here.

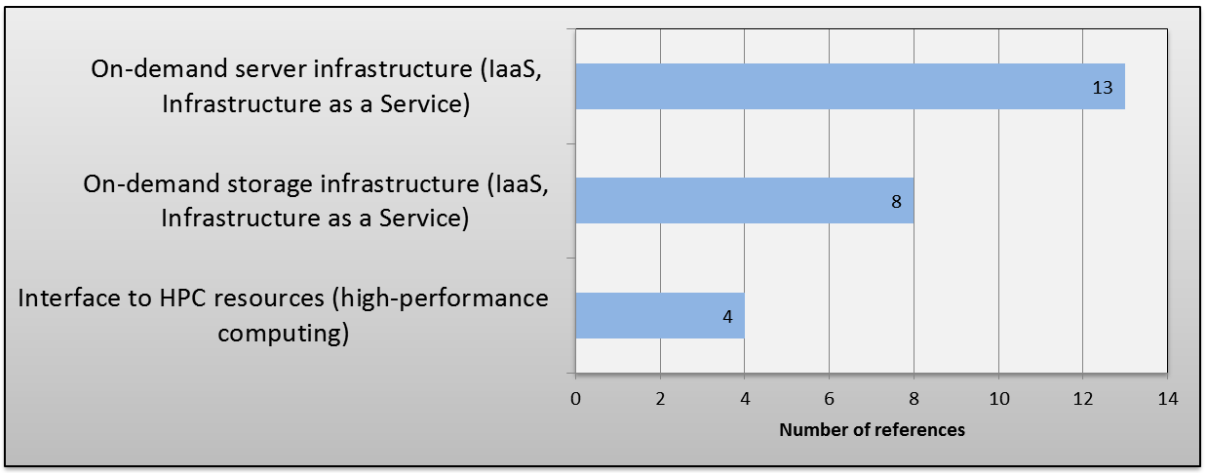

Figure 24: Function blocks referred to in the Cloud Computing field

4.3.2 Non-functional requirements

In addition to the functional requirements, the use cases also specified non-functional requirements. These are the quality features and constraints that services must take into consideration. As every use case includes functional and non-functional components, the requirements from the individual use cases are shown as a consolidated list in Table 4:

Non-functional requirement	Description
Governance	In order to ensure that the program achieves its long-term objectives, clear guidelines (governance) are needed. Governance includes definitions of accountabilities, responsibilities, structures and processes, which, among other things, guarantee openness and transparency.
Financing and billing	To ensure the sustainability of the national services and, therefore, this program, the financing and billing of services are of fundamental importance. 1. Financing the cost of providing the services. This includes the financial cost of creating a service and transforming it into a national service. 2. Safeguarding operation by billing for the operating costs. This can take the form of a fixed base amount or billing the user for the services actually used.
Operation	The aim of an operating model is to ensure the sustainability of the subsidized projects at a national level and to transfer a project or an existing service into regulated operation (defining and guaranteeing the SLAs).
Legal consultancy	The legal constraints on national services can be relatively complex. Legal consultancy is intended to support the service providers and operators in creating national services and organizations and to ensure that they are viable from the very beginning.
Consultancy and coordination centers	In addition to technical solutions, comprehensive technical consultancy and support is needed to allow individual services to be implemented, for example in areas such as license management, open access, coordinated access to resources (publications, computers, storage, etc.). These consultancy and coordination centers should be available on a national level so that they can be used by all universities.
Security	The security and correctness of the scientific data which are stored, managed and accessed as part of this program must be guaranteed at all times. This includes ensuring confidentiality, information security, data integrity and availability.
Usability	Services which are operated in a sustainable way should be easy to understand, learn and use. Carrying out usability tests at an early stage should improve usability and increase the acceptance of the national services.
Flexibility	The national services should be implemented in such a way that they can respond quickly to new or changed requirements. This means that the services must be based on open, internationally-recognized standards.
Performance and efficiency	To ensure that the national services can be used effectively, the response times of the systems must allow for normal working and it must be possible to use the necessary IT resources. However, the services must also be cost-effective.

Non-functional requirement	Description
Basic conditions	Where necessary the foundations must first be laid to enable national services to be implemented (for example, billing for the services, publication under the terms of open access, defining and establishing the operational organization). The development process for the national services should take into consideration international projects in the field of scientific data and comply with national and international standards.

Table 4: Non-functional requirements from the use cases

5 Architecture

In this chapter the requirements identified from the use cases that have been recorded are transferred into a functional architecture. The individual function blocks are described and the main requirements specified in the function blocks. This results in the functional architecture which will be used to define a future service architecture for the national services.
The service architecture will ultimately form a valid long-term basis and a reference for the assessment, prioritization and strategic focus of the national services that are to be established.

5.1 Functional architecture

5.1.1 Overview of the functional architecture

An overview of the functional architecture grouped by fields of activity, which is based on the survey of the use cases and the resulting function blocks, is shown below.

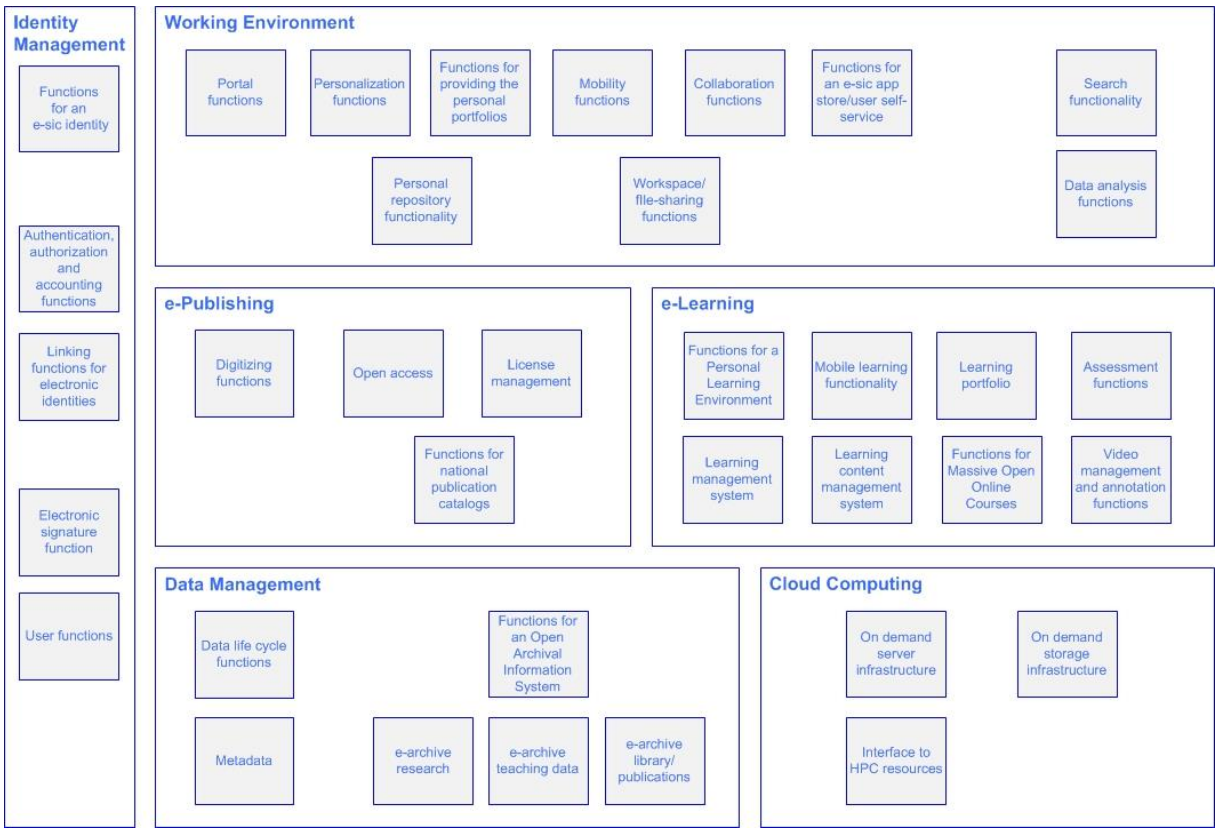

Figure 25: Functional architecture

5.1.2 Function blocks

The function blocks are clearly defined areas which describe functions and tasks relating to information in the scientific environment. They are used to structure the requirements which form the basis for the national services.

The following function blocks have been defined:
(The function blocks are not numbered in order of priority.)

Identity Management	
No.	**Function block**
F-IM-1	Functions for an e-sic identity
F-IM-2	Authentication, authorization and accounting functions
F-IM-3	Linking functions for electronic identities
F-IM-4	Electronic signature function
F-IM-5	User functions
Working Environment	
No.	**Function block**
F-WE-1	Portal functions
F-WE-2	Personalization functions
F-WE-3	Functions for providing the personal portfolios
F-WE-4	Mobility functions
F-WE-5	Collaboration functions (wikis, calendar, mail, e-meetings, social networking)
F-WE-6	Functions for an e-sic app store/user self-service (SaaS, Software as a Service)
F-WE-7	Personal repository functionality
F-WE-8	Workspace/file-sharing functions
F-WE-9	Search functionality
F-WE-10	Data analysis functions
e-Publishing	
No.	**Function block**
F-eP-1	Digitizing functions
F-eP-2	Open access
F-eP-3	License management
F-eP-4	Functions for national publication catalogs
e-Learning	
No.	**Function block**
F-eL-1	Functions for a Personal Learning Environment (PLE)
F-eL-2	Mobile learning functionality
F-eL-3	Learning portfolio (training catalog)
F-eL-4	Assessment functions
F-eL-5	Learning management system (admin)
F-eL-6	Learning content management system (content and storage)
F-eL-7	Functions for Massive Open Online Courses (MOOC)
F-eL-8	Video management and annotation functions
Data Management	
No.	**Function block**
F-DM-1	Data life cycle functions
F-DM-2	Metadata
F-DM-3	Functions for an Open Archival Information System (OAIS)
F-DM-4	e-archive research
F-DM-5	e-archive teaching data
F-DM-6	e-archive library/publications

Cloud Computing	
Nr.	**Function block**
F-CC-1	On demand server infrastructure (IaaS, Infrastructure as a Service)
F-CC-2	On demand storage infrastructure (IaaS, Infrastructure as a Service)
F-CC-3	Interface for HPC resources (high performance computing)

Table 5: List of the function blocks

Each function block is described in a matrix like the one below. The descriptions of each function block can be found in Annex D.

Field of activity	
No.	**Function block**
X-X	**Name of the function block**
	Description:
	▪ …
	Main functionalities:
	▪ …
	Derived from the following use cases:
	▪ …
	Existing projects and services based on the use cases:
	▪ …

Table 6: Matrix for the descriptions of the function blocks

5.2 Service architecture

5.2.1 Overview of the service architecture

The service architecture acts as the reference and the long-term foundation for developing and managing the service portfolio. The service architecture described below is based on the focus of program SUC P-2 (vision, strategy, top-down perspective) and the comparison with the function blocks (taken from the use cases, bottom-up perspective).

Using the service architecture, new needs and requirements can be assessed, prioritized and, where appropriate, adopted as new national services, in line with the program management process. The function blocks act as aids to help identify existing elements. The purpose of this is to ensure that the national service architecture can adapt permanently to the new or changed requirements that Switzerland, as a research location, has in relation to scientific information.

The figure below shows the current service architecture which forms the basis for the national services that will be established in program SUC P-2.

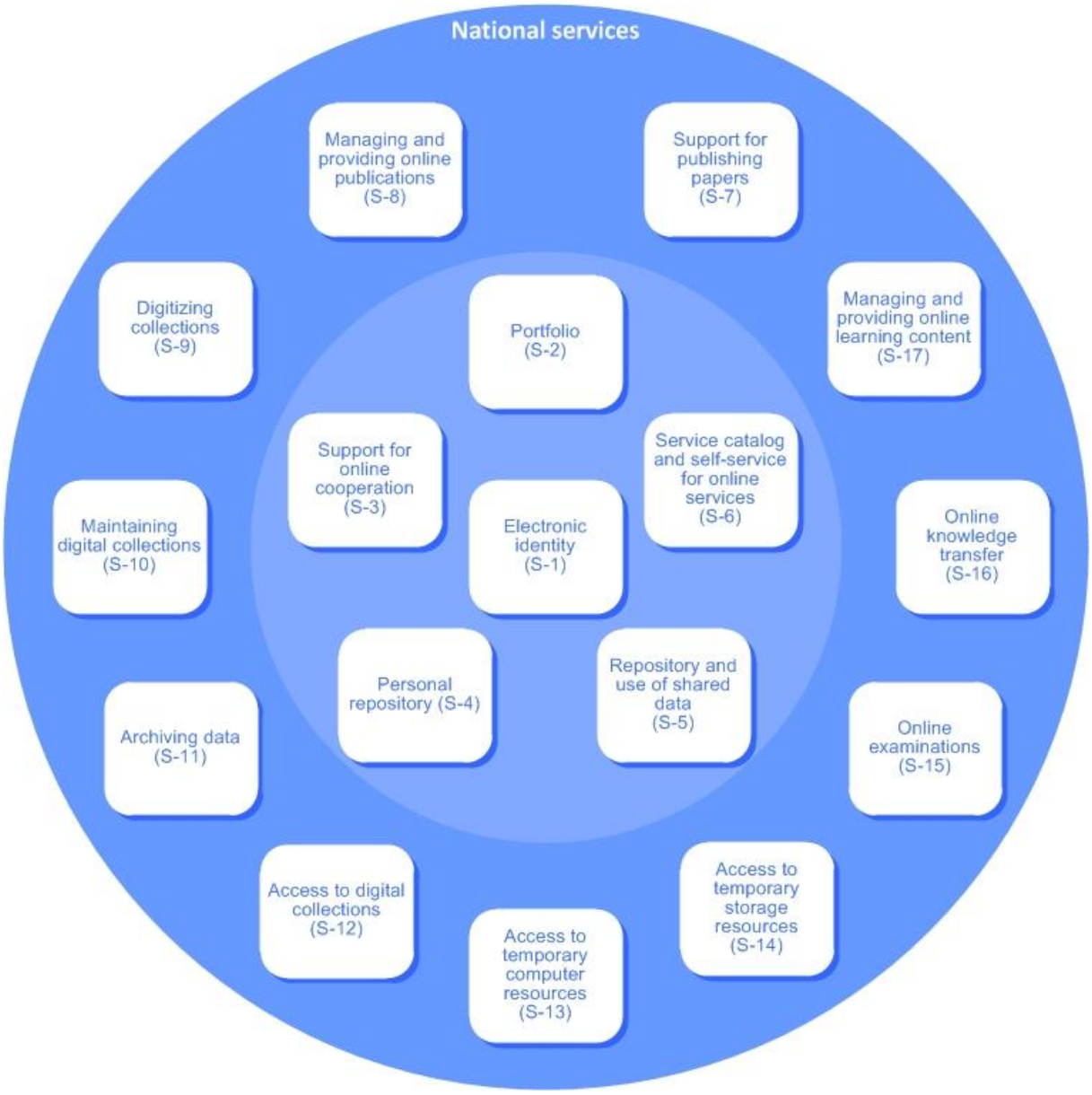

Figure 26: Overview of the service architecture

5.2.2 National services

The following national services have been defined:

(The services are not numbered in order of priority)

National services	
No.	**Service name**
S-1	**Electronic identity** The “Electronic identity” service provides a unique and permanent (lifelong) identity for every academic user in the whole of Switzerland. This service accompanies students, teachers, researchers and alumni throughout the entire life cycle and is independent of their status and the institution they belong to. The unique and permanent electronic identity forms the basis for further allocations, such as the user’s membership of an organization, role and authorizations. It is also compatible with other international identity infrastructures.

National services	
No.	**Service name**
S-2	**Portfolio** (career, degrees, training courses, own publications, etc.) The “Portfolio” service provides users with an online platform for the long-term storage and management of their academic data, such as information about their career, certificates, degrees, credits, training courses, research results and publications. Users can decide which of their data they want to make available to the academic community.
S-3	**Support for online cooperation** The “Support for online cooperation” service provides academic users with a national platform which makes general online cooperation possible in an intuitive way. It supports wikis, forums, project spaces, social platforms etc., together with the new online tools of the future.
S-4	**Personal repository (personal data)** The “Personal repository” service provides academic users with the option of storing their personal data in a secure location which is linked with their electronic identity. They can access and make use of their data wherever they are, including when they are on the move. The important factor is also preventing the data from being lost. Users can decide themselves which data they do and do not want to share with other people.
S-5	**Repository and use of shared data (papers, projects, etc.)** The “Repository and use of shared data” service makes it easy for users with the appropriate authorization to set up their own national repository, to which they can give other people access. As the owner of the repository, a user can provide other users with an electronic identity which entitles them to make joint use of the repository for papers and projects. When the paper or the project comes to an end, the owner of the repository can decide which data will be transferred to an electronic archive and which will be deleted.
S-6	**Service catalog and self-service for online services (hardware/software/tools)** The “Service catalog and self-service for online services” service gives academic users a standardized national service catalog containing all the online services that are available. Users can select a service in an intuitive way from the catalog and use it on the basis of their electronic identity/role.
S-7	**Support for publishing papers** The “Support for publishing papers” service is a national service which gives academic users a simple way of publishing their results. The service supports the process of publication (licensed via open access and/or via traditional publishing houses).
S-8	**Managing and providing online publications (licenses, open access)** The “Managing and providing online publications” national service guarantees the ongoing nationwide acquisition and availability of scientific publications.
S-9	**Digitizing collections (publications, images, maps, cultural heritage, etc.)** The “Digitizing collections” coordinated national service enables specific collections to be digitized and made available to academic users online wherever they may be.
S-10	**Maintaining digital collections (publications, images, videos, maps, cultural heritage, etc.)** The “Maintaining digital collections” service guarantees the long-term storage and maintenance of online collections throughout their entire life cycle. This also ensures that they can be read and will remain available online for a long period.
S-11	**Archiving data (primary, secondary, projects, etc.)** The “Archiving data” service is a simple means of enabling data to be archived. The owners of the data choose which data they would like to archive and when. In other words, they select what they want to be included in the online archive. Data that are archived are also assigned to a storage class.
S-12	**Access to digital collections (publications, images, videos, maps, cultural heritage, etc.)** The “Access to digital collections” service provides access at a national level to digital collections (catalogs and content). The availability and authorization for the online

National services	
No.	**Service name**
	collections are checked using the electronic identity. On this basis user-related functions such as “free access,” “free preview” and “paid access” are provided.
S-13	**Access to temporary computer resources** The “Access to temporary computer resources” service gives authorized users easy access to computer resources for a limited period of time for the purpose of preparing academic papers. At the end of the specified period, the computer resources are made available to other users.
S-14	**Access to temporary storage resources** The “Access to temporary storage resources” service gives authorized users easy access to storage resources for a limited period of time for the purpose of preparing academic papers. At the end of the specified period, the data are deleted and the storage resources are made available to other users.
S-15	**Online examinations** The “Online examinations” service provides a platform for secure online examinations and tests. Academic users can take examinations on this platform by means of their electronic identity.
S-16	**Online knowledge transfer** The “Online knowledge transfer” service provides an online learning environment for academic users which enables them to access learning content regardless of where they are located. It is tailored to their needs on the basis of their electronic identity. The generic format of the learning content makes it possible to transfer knowledge to teachers in a wide range of different forms. The service supports both hybrid and online training.
S-17	**Managing and providing online learning content** The “Managing and providing online learning content” national service allows a variety of different learning content to be developed, managed, exchanged and made available. The learning content is created in a generic format which enables it to be provided in a wide range of different forms.

Table 7: List of national services

In Strategy Phase 2, the list of national services will be developed in more detail and prioritized, so that the corresponding projects can be applied for, approved and implemented.

5.2.3 Relationship between the national services and the function blocks

A national service consists of several function blocks. A function block can be used for more than one national service. The following matrix shows the function blocks that each national service consists of.

National services / *Function blocks*		S-1	S-2	S-3	S-4	S-5	S-6	S-7	S-8	S-9	S-10	S-11	S-12	S-13	S-14	S-15	S-16	S-17
		Electronic identity	Portfolio (career, degrees, training courses, own publications, etc.)	Support for online cooperation	Personal repository (personal data)	Repository and use of shared data (papers, projects, etc.)	Service catalog and self-service for online services (hardware/software/tools)	Support for publishing papers	Managing and providing online publications (licenses, open access)	Digitizing collections (publications, images, maps, cultural heritage, etc.)	Maintaining digital collections (publications, images, videos, maps, cultural heritage, etc.)	Archiving data (primary, secondary, projects, etc.)	Access to digital collections (publications, images, videos maps, cultural heritage, etc.)	Access to temporary computer resources	Access to temporary storage resources	Online examinations	Online knowledge transfer	Managing and providing online learning content
Identity Management																		
F-IM-1	Functions for an e-sic identity	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
F-IM-2	Authentication, authorization and accounting functions	X		X	X	X		X	X	X	X	X	X	X	X	X	X	X
F-IM-3	Linking functions for electronic identities	X		X		X	X	X					X				X	X
F-IM-4	Electronic signature function		X			X										X		
F-IM-5	User functions			X									X	X	X	X	X	
Working Environment																		
F-WE-1	Portal functions						X	X	X		X		X	X	X	X	X	
F-WE-2	Personalization functions		X		X		X									X	X	
F-WE-3	Functions for providing the personal portfolios			X	X	X							X					
F-WE-4	Mobility functions		X				X									X	X	
F-WE-5	Collaboration functions (wikis, calendar, mail, e-meetings, social networking)			X		X						X					X	
F-WE-6	Functions for an e-sic app store/user self-service (SaaS, Software as a Service)						X							X	X		X	
F-WE-7	Personal repository functionality				X													
F-WE-8	Workspace/file-sharing functions			X		X						X						
F-WE-9	Search functionality				X	X							X					
F-WE-10	Data analysis functions												X					
e-Publishing																		
F-eP-1	Digitizing functions									X								
F-eP-2	Open access							X	X		X		X					
F-eP-3	License management							X	X				X					
F-eP-4	Functions for national publication catalogs							X	X	X	X		X					
e-Learning																		
F-eL-1	Functions for a Personal Learning Environment (PLE)																X	X
F-eL-2	Mobile learning functionality																X	X
F-eL-3	Learning portfolio (training catalog)																X	
F-eL-4	Assessment functions															X		
F-eL-5	Learning management system (admin)															X		X
F-eL-6	Learning content management system (content and storage)																X	X
F-eL-7	Functions for Massive Open Online Courses (MOOC)															X	X	X
F-eL-8	Video management and annotation functions															X	X	X
Data Management																		
F-DM-1	Data life cycle functions			X		X					X	X						
F-DM-2	Metadata					X		X		X	X	X						
F-DM-3	Functions for an Open Archival Information System (OAIS)										X	X						
F-DM-4	e-archive research		(X)1									X	(X)2					
F-DM-5	e-archive teaching data		(X)1									X	(X)2			X	X	X

F-DM-6	e-archive library/publications		(X)1					X	X	X	X	X	(X)2					
Cloud Computing																		
F-CC-1	On demand server infrastructure (IaaS, Infrastructure as a Service)													X				
F-CC-2	On demand storage infrastructure (IaaS, Infrastructure as a Service)														X			
F-CC-3	Interface to HPC resources (high performance computing)													X				

Legend:
X Function blocks required for the service (Current status from Strategy Phase 1. Modifications may be made when the services are defined in more detail in Strategy Phase 2)
(X)1 Link to data in the archives
(X)2 Read access to data in the archives

Table 8: Matrix showing national services and function blocks

On the one hand, the matrix shows which function blocks are used in each service and, on the other hand it highlights the dependencies when one function block appears in several services. The matrix forms the basis for developing the services in more detail during Strategy Phase 2 in order to meet the requirement for an integrated service landscape.

During the development of the national services, it is important to ensure that each service has clearly defined interfaces. In addition, the function blocks must be implemented in such a way that they can be used for all the relevant services. This will prevent the same function from being available in different versions and will minimize the number of interfaces.

6 Operating model

6.1 Vision for the operating model

The operating model should provide optimum support for the strategic focus of the CRUS in the area of scientific information. It can be formulated as follows:

The operating model supports consistent management and control and efficient and effective accessing and rendering of services in relation to the provision of scientific information.

6.2 Versions of the operating model

The provision of services can take various forms. We can distinguish between the following three fundamentally different models, which in turn allow for different forms within them:

- **The broker model,** which allows for decentralized provision of services coordinated by a central broker.
- **The decentralized model,** which allows for decentralized provision of services and decentralized access to services.
- **The model with a dedicated institution,** which allows for centralized provision of services. In this model, the service provider acts as a sole partner for the service users.

The following diagram summarizes the three operating models:

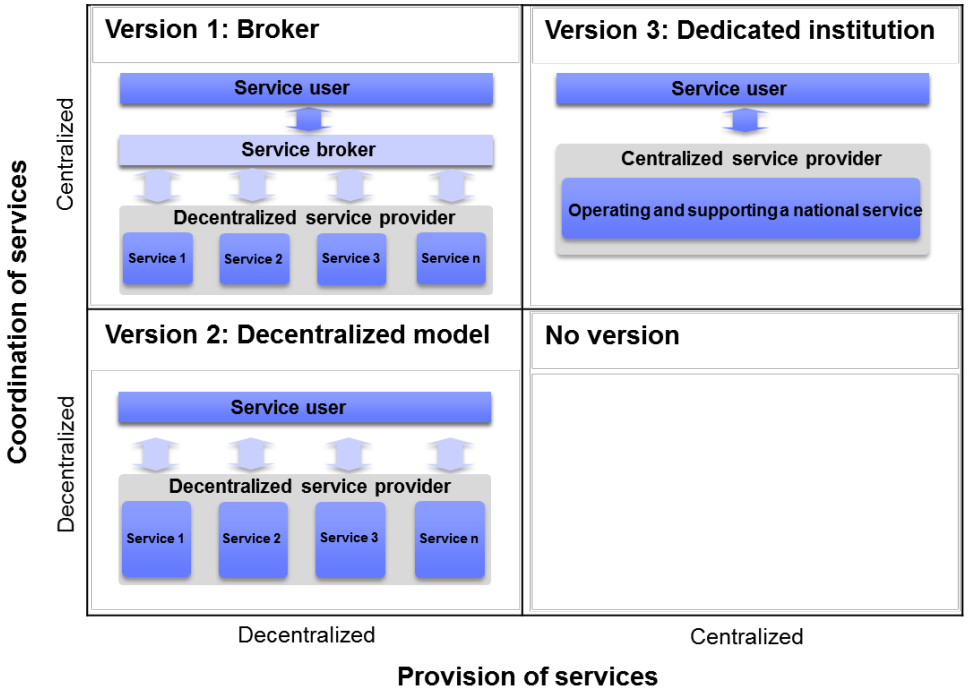

Figure 27: Versions of the operating model

In all operating models, the specialist and strategic direction of both the service provision and access to services is carried out by a managing committee. The managing committee determines the strategic focus for the services and defines generally-applicable rules and guidelines.

In the following sections, the three operating models will be described in more detail and evaluated.

6.2.1 Version 1: Broker model

Description

The broker model allows for decentralized provision of services coordinated by a central broker. The broker has the following responsibilities and duties:

- Maintaining the service catalog with the corresponding service features and the price or billing model
- Defining and measuring Key Performance Indicators (KPIs)
- Billing for services
- Managing the agreements on providing and accessing services
- Running a service desk

The broker provides service users with a centrally-managed service catalog, in which all services are listed with the corresponding Service Level Agreements (SLAs) and billing model. The service users access their services directly from the broker who is their central point of contact.

The broker is also the central point of contact for the various service providers. The broker and the service providers agree the SLAs for the provision of services and Key Performance Indicators (KPIs) to measure the service.

The broker model does not prevent service providers from concluding Operation Level Agreements (OLAs) directly with each other for reciprocal access to infrastructure services.

Furthermore, the internal organization of the broker model can vary. The duties the broker will actually take on, the demarcation between the broker and the managing committee, and the responsibilities the broker should have must be defined in detail.

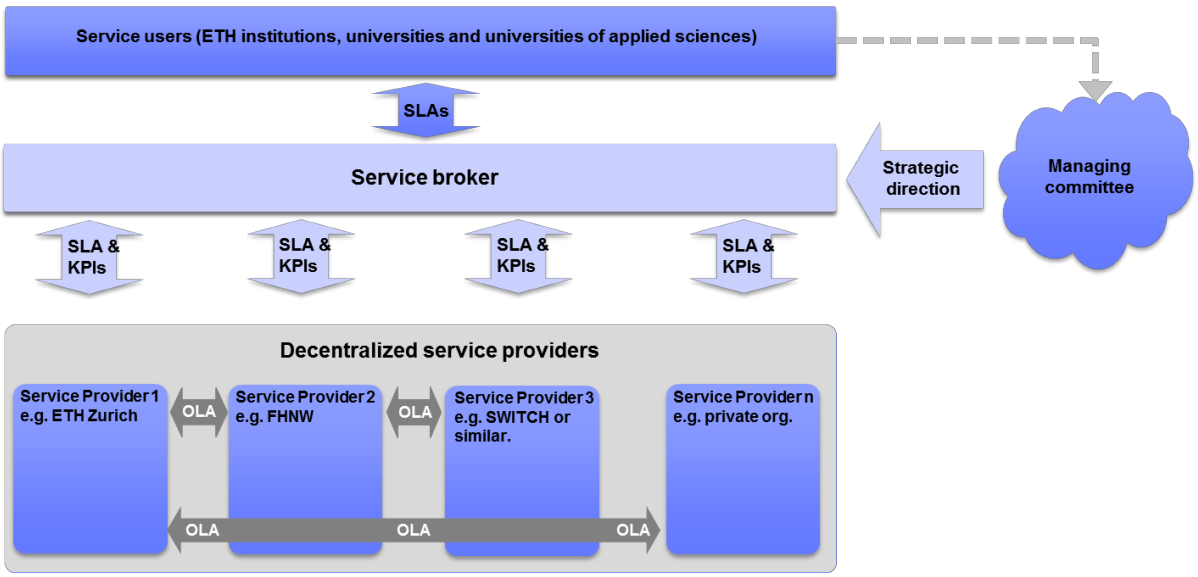

Figure 28: Version 1: Broker model

Advantages of the broker model

- The service users and service providers only need to contact one office and agree SLAs and KPIs once.
- The centralized specialist management ensures that all parties are operating within the same framework and that the same rules apply to everyone.
- Continued use can be made of existing expertise in service provision.
- New services can build on existing infrastructure elements, meaning that investments that have already been made can be protected sustainably.
- The service providers can concentrate on their core responsibilities.
- The broker can gather information and identify the needs of the parties involved with regard to further development and possibilities for positioning the services on offer strategically, then develop the service catalog in the direction required.

Disadvantages of the broker model

- The broker's role is very political. The appointment must be accepted by all involved to ensure that the rules agreed can actually be enforced. Otherwise, there is a risk that parties may bypass the broker, resulting in direct contact between service providers and service users. This is especially likely to occur if parties suspect that the independence or impartiality of the broker is no longer guaranteed.
- Using a broker makes accessing services more complicated. On the one hand, more complex processes are required, while, on the other hand, the use of a broker means additional costs in terms of the resources required (financial, personnel).

6.2.2 Version 2: Decentralized provision of services

Description

In Version 2, the services are provided using a decentralized method and without central coordination. SLAs and the necessary measurement systems and KPIs are worked out in a decentralized manner, directly between the service provider and the service user.

In the decentralized model, the individual service providers have the following responsibilities:

- Maintaining the service catalog with the corresponding service features and the price or billing model
- Defining and measuring Key Performance Indicators (KPIs)
- Billing for services
- Accepting and implementing new strategic guidelines that are defined by the specialist management
- Managing the agreements on providing and using services
- Running a service desk
- Making decisions about the provision of services
- Providing the actual service

In the decentralized model, the managing committee must take on additional controlling duties that are carried out directly by the broker in the broker model. This primarily includes the further development of services by maintaining and developing the service catalog.

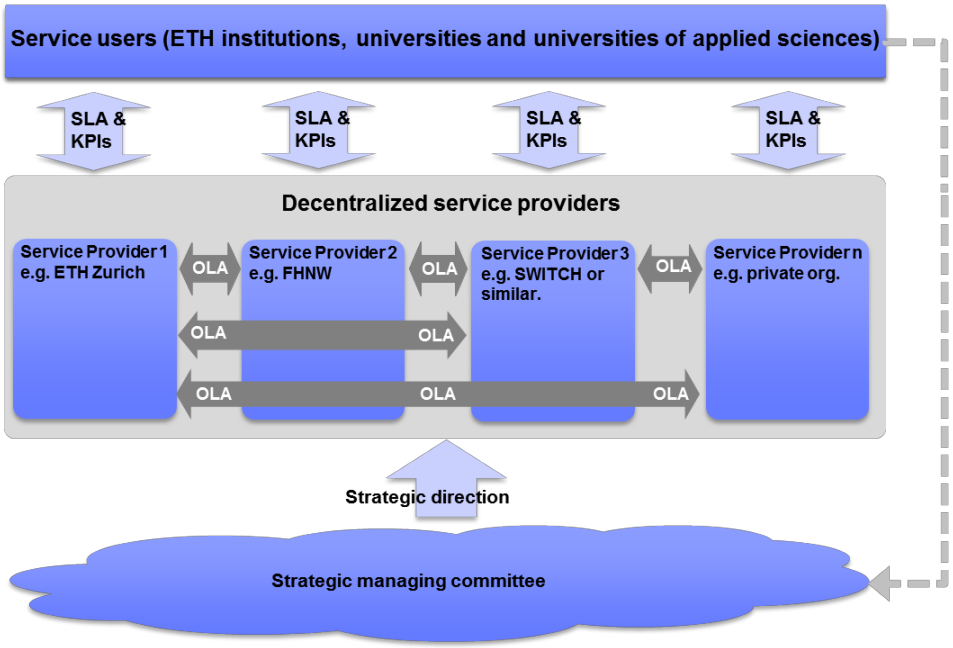

Figure 29: Version 2: Decentralized provision of services

Advantages of the decentralized model

- In the decentralized model, the individual partners have more flexibility with regard to organizing the provision of services and access to services. The SLAs are defined directly and individually between two partners.
- The service provider may agree SLAs for the same service differently with different partners. These direct agreements permit a certain level of unequal treatment.
- Direct communication channels.

Disadvantages of the decentralized model

- The most important consideration is that this model requires more effort in comparison to the broker model, because similar contracts need to be negotiated with several partners and the number of SLAs to be managed is greater in general.
- There are more communication channels, because each service user must maintain contact with each of the relevant service providers.
- Both service users and service providers are unable to concentrate on their own core responsibilities, because they have to manage the access to services. This makes it more difficult for partners to specialize.
- Politically-motivated unequal treatment may occur depending on the size and influence of the partners involved.
- There is a risk that the provision of national services will not be possible, because there are identical services with different framework conditions (different SLAs/KPIs depending on the service user).

6.2.3 Version 3: Model with a dedicated institution

Description

The third conceivable operating model allows for a dedicated institution to provide all services centrally. This can be an existing institution or a new one established for this purpose. The central service provider makes services available that can be accessed by the service users according to consistently defined SLAs.
The central service provider has fundamentally the same responsibilities as the individual service providers in the decentralized model. The centralized model explicitly prevents technical services from being provided using a decentralized method.

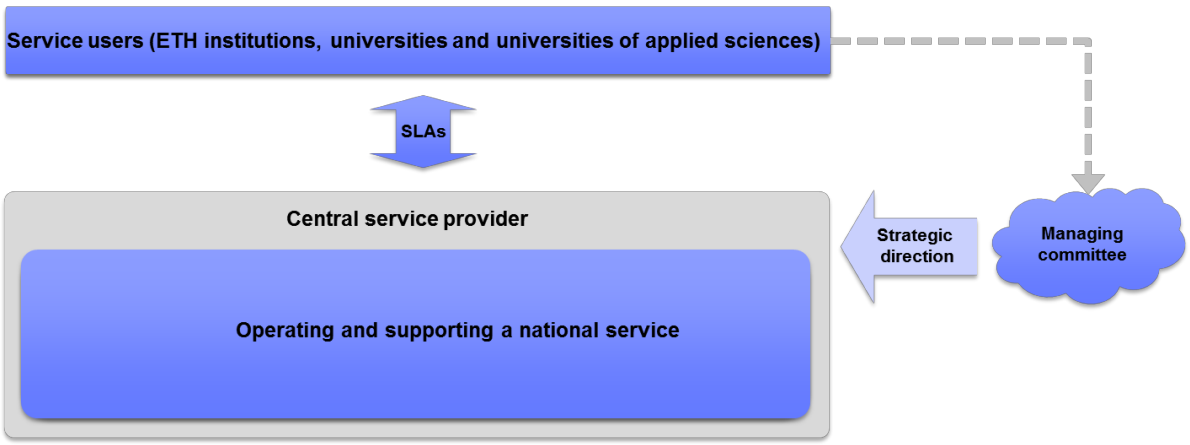

Figure 30: Version 3: Centralized provision of services

The managing committee plays a supervisory role in the centralized model and should be made up of the service users involved.

Advantages of the centralized model

- There is an opportunity to specialize within the area of service provision.
- Synergies in the provision of services can be used to best advantage.
- Processes can be standardized and applied across different areas.
- The central management of the service catalog also enables a certain flexibility in the strategic focus – decisions can be made more quickly and more independently.
- All service users have a central point of contact.

Disadvantages of the centralized model

- Existing services must be transferred to the central service provider. The knowledge gained by the previous service provider is therefore lost.
- There is a risk that the managing committee may lose control because the influence of the central service provider is (too) strong.
- Creating a central service provider is very cost-intensive.

6.3 Evaluation of the operating models

Table 9 below provides an evaluation of the operating models. The comparison shows that the broker model is rated best on average.

Criteria \ Model	(1) Broker	(2) Decentralized	(3) Centralized
Adherence to the strategy	++	o	--
Potential acceptance	+	o	--
Sustainability	++	-	++
Ease of operation	o	--	+
Ease of organization	+	--	++

Key:

Positive		Neutral	Negative	
++	+	o	-	--

Table 9: Comparison of the operating models

Advantages of the broker model in comparison to the other operating models

- The strategy of Program SUC P-2 is adhered to:
  - The services are built on existing projects and services.
  - The services on offer are available to all partners.
- The broker's control ensures that all service users receive the same service.
- The broker model is already successfully established and accepted in the network and identity management areas (with SWITCH as the broker).
- The model is guaranteed to be economical because the broker only offers services with sufficient demand that will therefore finance themselves.
- Simple access model from the perspective of service users.
- Competition between the service providers leads to improved quality.
- The broker model can be combined with the centralized model. For example, it is perfectly conceivable for the broker to operate and offer individual services.

6.4 Broker's organizational structure

The broker ought to be able to cover or provide the following organizational structures and areas of responsibility:

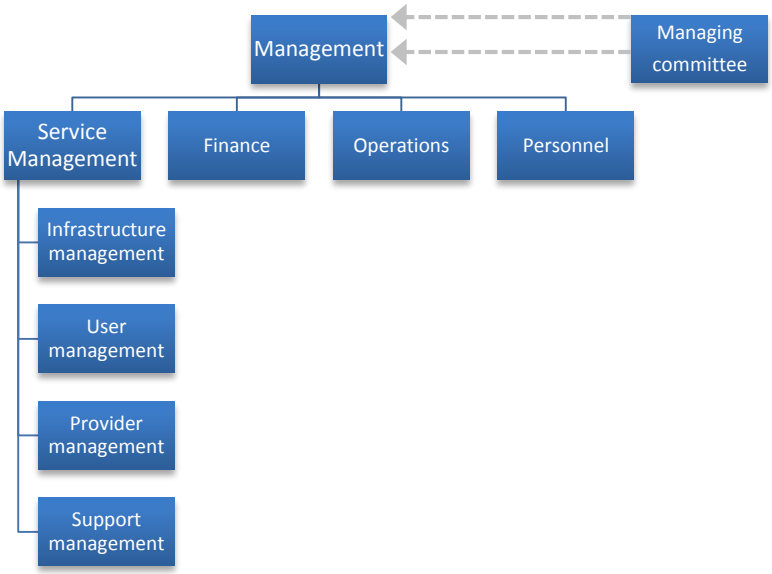

Figure 31: Broker's organizational structure

Brief description of the organizational units:

- **Managing committee**
  The managing committee is responsible for the strategic supervision of the broker and for issuing policies and guidelines about the general focus of the services. It also makes decisions about the billing model and any additional budgeting issues. The service users involved should be represented in the managing committee.
- **Management**
  The broker's management is responsible for the broker's business activities.
- **Service management**
  - Managing the service architecture: continuing to develop the service architecture, dealing with new requirements and defining new national services and the necessary interfaces
  - Managing the service users: account management, service catalog
  - Managing the service providers: change and request management, SLAs/OLAs
  - Service support: service desk, recording change requests
- **Finances**
  Billing for the services
- **Operations**
  Running the services that are provided centrally by the broker
- **Personnel**
  The broker's personnel department

Annex A International efforts

The table below lists a selection of similar activities in other countries. The list details comparable programs and efforts in other countries in the EU or internationally and makes no claims of being complete.

Wissenschaftsrat	*Country:* Deutschland
	Description:
	Wissenschaftsrat: Empfehlungen zur Weiterentwicklung der wissenschaftlichen Informationsinfrastrukturen in Deutschland bis 2020
	Link: http://www.wissenschaftsrat.de/download/archiv/2359-12.pdf
	Areas of overlap with Program SUC P-2: Antrag und Allgemein CRUS P-2 Programm, Handlungsfeld „e-Publishing“, „Data Management“
Schwerpunktinitiative "Digitale Information"	*Country:* Deutschland
	Description:
	Die Schwerpunktinitiative "Digitale Information" ist eine gemeinsame Initiative der Allianz der Wissenschaftsorganisationen zur Verbesserung der Informationsversorgung in Forschung und Lehre. Mit der Initiative verfolgen die Wissenschaftsorganisationen das Ziel, digitale Publikationen, Forschungsdaten und Quellenbestände möglichst umfassend und offen bereit zu stellen und damit auch ihre Nachnutzbarkeit in anderen Forschungskontexten zu gewährleisten, optimale Voraussetzungen für die internationale Verbreitung und Rezeption von Publikationen und Forschungsdaten aus der deutschen Wissenschaft zu schaffen, die langfristige Verfügbarkeit der weltweit erworbenen digitalen Medien und Inhalte sowie ihre Integration in die digitale Forschungsumgebung sicherzustellen und IT-gestützte Formen des wissenschaftlichen Arbeitens durch innovative Informationstechnologien und digitale Methoden zu unterstützen.
	Link: http://www.allianzinitiative.de/de/start/
	Areas of overlap with Program SUC P-2: Handlungsfeld „e-Publishing“, „Data Management“
ESFRI	*Country:* EU, European Commission
	Description:
	European Strategy Forum on Research Infrastructures (ESFRI) ESFRI, the European Strategy Forum on Research Infrastructures, is a strategic instrument to develop the scientific integration of Europe and to strengthen its international outreach. The competitive and open access to high quality Research Infrastructures supports and benchmarks the quality of the activities of European scientists, and attracts the best researchers from around the world.
	Link: http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri
	Areas of overlap with Program SUC P-2: Forschungsinfrastrukturen, Handlungsfeld „Working Environment“, „Identity Management“

e-Infrastructures FP7 (Seventh Research Framework Programme)	*Country:* EU, European Commission
	Description:
	The e-Infrastructures activity, as a part of the Research Infrastructures programme, focuses on ICT-based infrastructures and services that cut across a broad range of user disciplines. It aims at empowering researchers with an easy and controlled online access to facilities, resources and collaboration tools, bringing to them the power of ICT for computing, connectivity, storage and instrumentation. This allows for instant access to data and remote instruments, "in silico" experimentation, as well as the setup of virtual research communities (i.e. research collaborations formed across geographical, disciplinary and organisational boundaries). Under FP7, the e-Infrastructures activity is part of the Research Infrastructures programme, funded under the FP7 'Capacities' Specific Programme. It focuses on the further development and evolution of the high-capacity and high-performance communication network (GÉANT), distributed computing infrastructures (grids and clouds), supercomputer infrastructures, simulation software, scientific data infrastructures, e-Science services as well as on the adoption of e-Infrastructures by user communities. Part on the e-Infrastructures activity are the Networking European Scientific Repositories DRIVER (Digital Repository Infrastructure Vision for European Research). Considered the largest initiative of its kind in helping to enhance repository development worldwide, DRIVER is a multi-phase effort whose vision and primary objective is to create a cohesive, robust and flexible, pan-European infrastructure for digital repositories, offering sophisticated services and functionalities for researchers, administrators and the general public.
	Link: http://cordis.europa.eu/fp7/ict/e-infrastructure/home_en.html http://www.driver-repository.eu/
	Areas of overlap with Program SUC P-2: Antrag und Allgemein CRUS P-2 Programm, Handlungsfeld „Cloud Computing“, „Working Environment“, „e-Publishing“
EC Open Data Pilot Open Access in FP7	*Country:* EU, European Commission
	Description:
	OpenAIRE, LIBER and COAR make recommendations for EC Open Data Pilot With digital data being declared as the 'new gold', the European Commission is developing a pilot to explore ways to make research data open access too. The pilot will look at research data generated in projects funded under the Horizon 2020 framework, with the aim of stimulating the data-sharing culture among researchers and facilitating both the re-use of information and data-driven science. As organisations with a strong interest in Open Data, Open Access Infrastructure for Resarch in Europe (OpenAIRE), the Association of European Research Libraries (LIBER) and the Confederation of Open Access Repositories (COAR) provided their views on the current situation and made recommendations for an effective Open Data Pilot at a hearing held by the European Commission on 2 July 2013, Brussels.
	Link: http://www.openaire.eu/ http://www.openaire.eu/en/open-access/open-access-in-fp7
	Areas of overlap with Program SUC P-2: „e-Publishing“, „Data Management“

Jisc programmes	*Country:* UK
	Description:
	Jisc programmes support and innovate the use of ICT in education and research. Vision: To make the UK the most digitally advanced education and research nation in the world. Mission: To enable people in higher education, further education and skills in the UK to perform at the forefront of international practice by exploiting fully the possibilities of modern digital empowerment, content and connectivity
	Link: http://www.jisc.ac.uk/whatwedo/programmes/
	Areas of overlap with Program SUC P-2: alle Handlungsfelder
SURF's seventh Strategic Plan	*Country:* NL
	Description:
	SURF is the collaborative organisation for ICT in Dutch higher education and research. SURF brings together ICT professionals within networks and collaboration projects for knowledge sharing regarding ICT-driven innovation. By making innovations available on attractive conditions and facilitating connections between technology and people, SURF ensures the continued optimal utilisation of the opportunities offered by ICT. Thanks to SURF students, instructors and researchers in the Netherlands have access to the best possible Internet and ICT services. Research universities, universities of applied sciences, and research institutions share their knowledge and collaborate on innovative projects intended to improve the quality of higher education and research. SURF subsidises these projects. *SURF's seventh Strategic Plan in a row describes the developments in ICT for Dutch higher education and research for the period 2011-2014. It also highlights the priorities.*
	Link: http://www.surf.nl http://www.surf.nl/en/publicaties/Documents/SURF%20Strategic%20Plan%202011%202014.pdf
	Areas of overlap with Program SUC P-2: alle Handlungsfelder
XSEDE	*Country:* US
	Description:
	The Extreme Science and Engineering Discovery Environment (XSEDE) XSEDE is the most powerful and robust collection of integrated advanced digital resources and services in the world. It is a single virtual system that scientists can use to interactively share computing resources, data, and expertise. Scientists and engineers around the world use these resources and services - things like supercomputers, visualization and data analysis systems and tools, and data collections - to propel scientific discovery and improve our lives. They are a crucial part of research in fields like earthquake modeling, materials science, medicine, epidemiology, genomics, astronomy, and biology. XSEDE supports 16 supercomputers and high-end visualization and data analysis resources across the country. More details on these resources are available on the Resources area.
	Link: https://www.xsede.org/
	Areas of overlap with Program SUC P-2: Handlungsfeld „Cloud Computing“, „Working Environment“, „e-Learning“

Table 10: Selection of efforts in other countries

Annex B Template for recording use cases

Attribute		Description	
0. Title			
1. Submitting Person		*Person describing the use case with this form.*	
	Title:		
	First Name:		
	Last Name:		
	e-Mail:		
	Telephone:		
2. Organizational Unit		*Organizational unit describing the use case.*	
	Universities	☐	University of Basel Organizational unit(s):
		☐	University of Berne Organizational unit(s):
		☐	University of Fribourg Organizational unit(s):
		☐	University of Geneva Organizational unit(s):
		☐	University of Lausanne Organizational unit(s):
		☐	University of Lucerne Organizational unit(s):
		☐	University of Neuchâtel Organizational unit(s):
		☐	University of St. Gallen Organizational unit(s):
		☐	University of Italian Switzerland Organizational unit(s):
		☐	University of Zurich Organizational unit(s):
	Federal Universities	☐	Swiss Federal Institute of Technology Lausanne (EPFL) Organizational unit(s):
		☐	Swiss Federal Institute of Technology Zurich (ETH) Organizational unit(s):
	Universities of Applied Sciences	☐	University of Applied Sciences Berne (BFH) Organizational unit(s):
		☐	University of Applied Sciences and Arts Northwestern Switzerland (FHNW) Organizational unit(s):
		☐	University of Applied Sciences Eastern Switzerland (FHO) Organizational unit(s):
		☐	University of Applied Sciences and Arts Lucerne (HSLU) Organizational unit(s):
		☐	University of Applied Sciences and Arts Western Switzerland (HES-SO) Organizational unit(s):
		☐	Kalaidos University of Applied Sciences Switzerland (FH KAL) Organizational unit(s):
		☐	University of Applied Sciences and Arts of Southern Switzerland (SUPSI) Organizational unit(s):

Attribute		Description	
		☐	University of Applied Sciences Zurich (ZFH) Organizational unit(s):
	Others	☐	Conference of Swiss University Libraries (KUB)
		☐	Expert Committee of Swiss University of Applied Sciences Libraries (FHB)
		☐	Educational Technology Working Group (ETWG)
		☐	Swiss National Grid Association (SwiNG)
		☐	Association of IT Services of the Swiss Universities (ASIUS)
		☐	Expert Committee of IT Services of the Swiss Universities of Applied Sciences (FID)
		☐	SWITCH
		☐	Others:
3. Contact Person		*Person who is responsible on the functional level*	
	Title:		
	First Name:		
	Last Name:		
	e-Mail:		
	Telephone:		
4. Organization/Domain		*Organizational impact of the use case (national, institute, area):*	
	Primary Organization	*Affected organization(s):*	
		Number of potential users:	
	Secondary Organization	*Which organizations could also be affected by this use case?*	
		Amount of additional users:	
5. Time Frame		*In what time frame should the use case be realized?*	
6. Abstract		*Brief description of the use case (in your own words)* - Description of the functional components covering the use case.	
7. Objective		*What objective(s) should be achieved with the use case?*	
8. Expected Benefits		*What are the expected benefits of the use case?* - Focus on quantifiable benefits	
9. Main Requirements		*Description of the main functional requirements (features) (max. 5 – 10 requirements) of the use case.*	
10. Domain Allocation		*Allocation of the use case to the defined domains* - Single or multiple selections possible	
		☐	e-Publishing
		☐	Data Management
		☐	Identity Management
		☐	Cloud Computing
		☐	e-Learning
		☐	Working Environment
		☐	Other Domains: Description:

Attribute		Description					
11. Dependencies		*Description of dependencies and interfaces to other use cases and projects.*					
12. Amount / Growth		*Expected amount and growth of data and users for this use case.*					
	Data	Estimated initial amount of data [TB]					
		Estimated data growth per year [%/Year]					
	Access	Estimated amount of simultaneous users at access [#]					
		Estimated growth of users per year [%/Year]					
13. Cost Estimation		*Estimated investments/cost for this use case.*					
		☐	Currently not estimable				
	Investment cost (CAPEX)	Total: - Project costs - Investments - Infrastructure - Etc. Per year	Year 1:	Year 2:	Year 3:	Year 4:	Year 5:
	Operation expenses (OPEX)	Total: - Personnel cost - License costs - Maintenance - Etc. Per year	Year 1:	Year 2:	Year 3:	Year 4:	Year 5:
14. Additional Information		References to other information sources to the use. - Link to additional information:					
15. Existing Project		*Is there already a project running for this use case (currently being implemented)?* *(if no, please leave empty and jump to the next category)*					
	Project Name	.					
	Responsible Organization						
	Project Leader						
	Abstract						
	Projects Status	☐	Research				
		☐	Study				
		☐	Concept				
		☐	Specification				
		☐	Realization				
	Users / Domain						
	Estimated Number of Users						
	Estimated Amount of Data						
	Planned Operator						
	Financing (Who and how)						
	Additional Information						

Attribute		Description
	Link to the Project	
16. Existing Service		*Is there already a service in place for this use case (available service in production)?* *(if no, please leave empty)*
	Service Name	
	Operator of the Service	
	Contact	
	Abstract	
	Service Status	☐ Pilot ☐ Production
	Users / Domain	
	Estimated Number of Users	
	Estimated Amount of Data	
	Operator	
	Financing (Who and how)	
	Additional Information	

Table 11: Use case template

Annex C Overview of use cases received

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
001	01-CRUS_UseCase-SwiNG-SyBIT-CollaborationWiki.doc	Dr	Peter	**Kunszt**	X	X		X	X	X	X
002	02-CRUS_UseCase-SwiNG-SyBIT-CollaborationWeb.doc	Dr	Peter	**Kunszt**	X	X	X	X	X	X	X
003	03-CRUS_UseCase-SwiNG-SyBIT-CollaborationMailinglist.doc	Dr	Peter	**Kunszt**					X	X	X
004	04-CRUS_UseCase-SwiNG-SyBIT-CollaborationCoderepository.doc	Dr	Peter	**Kunszt**		X			X	X	X
005	05-CRUS_UseCase-SwiNG-SyBIT-DataAnalysisCluster.doc	Dr	Peter	**Kunszt**		X	X	X			X
006	06-CRUS_UseCase-SwiNG-SwiNG-NGI.doc	Dr.	Sigve	**Haug**		X	X	X			X
007	07-CRUS_UseCase-SwiNG-SyBIT-DistributedCloud.doc	Dr	Peter	**Kunszt**		X	X	X			X
008	08-CRUS_UseCase-SwiNG-SyBIT-ScalableStorage.doc	Dr	Peter	**Kunszt**		X	X	X		X	X
009	09-CRUS_UseCase-SwiNG-SyBIT-ScalableArchive.doc	Dr	Peter	**Kunszt**	X	X	X	X	X	X	X
010	10-CRUS_UseCase-SwiNG-SyBIT-WorkflowSaaS.doc	Dr	Peter	**Kunszt**		X	X	X	X	X	X
011	11-CRUS_UseCase-SwiNG-SyBIT-SharedStorage.doc	Dr	Peter	**Kunszt**		X	X	X	X	X	X
012	12-CRUS_UseCase-SwiNG-FMI-IRIS.doc		Dean	**Flanders**			X	X		X	X
013	13-CRUS_UseCase-SwiNG-SMSCG.doc	Dr	Sergio	**Maffioletti**		X	X	X			X
014	14-CRUS_UseCase-SwiNG-SyBIT-MicroscopyImages.doc	Dr	Peter	**Kunszt**	X	X	X	X	X	X	X
015	16-CRUS_UseCase-SwiNG-SyBIT-SaaSPortal.doc	Dr	Peter	**Kunszt**				X			X
016	17-CRUS_UseCase-SwiNG-SyBIT-FIM.doc	Dr	Peter	**Kunszt**				X		X	X
017	18-CRUS_UseCase-SwiNG-ETH-Bursting.doc	Dr	Peter	**Kunszt**				X			X
018	19-CRUS_UseCase-SwiNG-GC3-A4Mesh.doc	Dr.	Sergio	**Maffioletti**		X	X	X			X
019	20-CRUS_UseCase-SwiNG-GC3-CDS.doc	Dr	Sergio	**Maffioletti**		X	X	X			X
020	21-CRUS_UseCase-SwiNG-GC3-SwissExperiment.doc	Dr	Sergio	**Maffioletti**				X			X
021	22-CRUS_UseCase-SwiNG-LHC-Cloud-HPC.doc	Prof, Dr	Christophorus, Sigve	**Grab, Haug**		X	X	X			
022	23-CRUS_UseCase-SwiNG-SyBIT-buildsystem.doc	Dr	Peter	**Kunszt**				X			X
023	A-1a_CRUS_UseCase_Annot_Assess_UNIL.doc	Dr	Marc	**Sohrmann**					X	X	

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
024	A-1b-CRUS_UseCase_Video_UNIL.doc	Dr	Marc	**Sohrmann**	X	X	X		X	X	
025	A-3_CRUS_UseCase-Image_Annotation_UNIL.doc	Ingénieur pédagogique	Romain	**Voisard**		X			X		
026	A-4_CRUS_UseCase_Visual_Models_UNIL.doc	Dr.	Nadia	**Spang Bovey**		X			X		
027	A2-CRUS_UseCase_Text_Annotation_UNILv2.doc	Ingénieur pédagogique	Romain	**Voisard**		X			X		
028	academic_integrity_CRUS_UseCase.doc	Dr	Stefano	**Tardini**			X		X		
029	B_CRUS_UseCase_ePortfolio_UNIL.doc	Dr.	Nadia	**Spang Bovey**		X	X		X		
030	CHMooc2.doc	Professor	Anne-Dominique	**Salamin**		X	X	X	X	X	
031	cMOOC_NCCR_Astrophysics_G_Schiltz.doc	Dr.	Guillaume	**Schiltz**	X	X		X	X	X	
032	Competence-based assessment - long menu.docx	Dr. med	Sören	**Huwendiek**					X		
033	Connectivist MOOC_v3.doc		Denis	**Gillet**					X		
034	connectivist_educational_workflow_management_systems.doc	Dr.	Daniel	**Schneider**	X		X	X	X	X	
035	CRUS UseCase Orphan Works_Repository.doc	Frau	Andrea Ruth	**Schreiber**	X	X					
036	CRUS_jusbib_v3.doc	Herr	Christian /Sadri	**Schlumpf /Saieb**		X					
037	CRUS_Use Case-Template_v3.0_de_[Lizenzierung_elektronischer_Ressourcen].doc	Frau	Pascalia	**Boutsiouci**	X						
038	CRUS_Use Case-Template_v3.0_de_[Nationallizenzen].doc	Frau	Pascalia	**Boutsiouci**	X						
039	CRUS_UseCase-3D Digitalisieren.doc	Dr.	Michel	**Pfeiffer**	X					X	X
040	CRUS_UseCase-AcademicIdentity-UniFR.docx	M.	Johann	**Luethi**		X	X	X	X		
041	CRUS_UseCase-BiozentrumBC2 _final.doc	Prof	Torsten	**Schwede**		X		X		X	X
042	CRUS_UseCase-Cloud personel institutionel.doc	M.	Olivier	**Jeannin**		X		X	X	X	
043	CRUS_UseCase-Community_HPC_Cloud-en.doc	Dr	Jean-François	**Rossignol**		X		X			X
044	CRUS_UseCase-DOI-Registrierung.doc	Frau	Barbara	**Hirschmann**	X	X					
045	CRUS_UseCase-E-Books-Plattform.doc	Prof.	Rudolf	**Mumenthaler**	X	X			X	X	

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
046	CRUS_UseCase-E-Books.doc	Prof.	Rudolf	**Mumenthaler**	X						
047	CRUS_UseCase-EnhancedEBooks.doc	Prof.	Bruno	**Wenk**	X				X		
048	CRUS_UseCase-ETH-ORCID-final.doc		Barbara	**Hirschmann**	X						
049	CRUS_UseCase-Extend LMS for Programming Skills.doc	Prof.	Dominique	**Herren**					X		
050	CRUS_UseCase-frameworks-for-research-data.doc	Prof. Dr. / Dr.	Christian / Cornelia	**Fuhrer / Schauz**	X	X					
051	CRUS_UseCase-general_physicians_identity-final.doc		Christoph	**Graf**	X		X				
052	CRUS_UseCase-identity-matrix-Scherly-final.doc	Dr	Daniel	**Scherly**			X				
053	CRUS_UseCase-IdentityManagement_PSI_Umbrella16042013-final.doc	Dr.	Stephan	**Egli**		X	X			X	
054	CRUS_UseCase-ID_Platform-final.doc		Rolf	**Brugger**			X			X	
055	CRUS_UseCase-Infoclio2013.doc		Enrico	**Natale**							
056	CRUS_UseCase-InForm-UniFR.docx	Mr	Sergio	**Hoein**					X	X	X
057	CRUS_UseCase-LearnerID-final.doc	Dr.	Rolf	**Brugger**		X	X			X	
058	CRUS_UseCase-LegalCloudBox-UniFR_bereinigt.doc		Christian	**Sanzey**		X		X	X		
059	CRUS_UseCase-LinkedIn_11_04_13.doc	Dr.	Melanie	**Paschke**			X			X	
060	CRUS_UseCase-Lizenzen-mit-Open-Access.doc	Prof. Dr.	Christian	**Fuhrer**	X						
061	CRUS_UseCase-ltp-oais-workflow.doc		Marion / Dirk	**Prudlo / Verdicchio**	X						X
062	CRUS_UseCase-lza-infrastructure.doc		Marion / Dirk	**Prudlo / Verdicchio**	X	X					X
063	CRUS_UseCase-Mobile Learning (FHNW).doc		Christoph	**Pimmer**					X	X	X
064	CRUS_UseCase-Mobility-UniFR.docx	Dr	Jacques	**Monnard**				X	X	X	
065	CRUS_UseCase-MyPLE-UniFR.docx		Hervé	**Platteaux**				X	X	X	
066	CRUS_UseCase-Nationaler_Bibliotheks-IdP-final_bereinigt.doc	Herr	Andres	**von Arx**			X				
067	CRUS_UseCase-oa-research-management-evaluation.doc		Marion / Dirk	**Prudlo / Verdicchio**	X						X

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
068	CRUS_UseCase-PortableTraces-UniFR.docx		Hervé Platteaux	**Sergio Hoein**		X	X	X	X		
069	CRUS_UseCase-PRE (EN).doc	M	Pierre-Yves	**Burgi**		X				X	
070	CRUS_UseCase-ProductionAndPublicationLine-UniFR_bereinigt.doc		Christian	**Sanzey**	X	X		X	X		
071	CRUS_UseCase-rechtsgutachten-oa-foda-lza.doc		Marion / Dirk	**Prudlo / Verdicchio**	X	X					X
072	CRUS_UseCase-RepositoryObjectReuse (FR).doc		Jan	**Melichar**		X			X	X	
073	CRUS_UseCase-ResearcherIdentification-final.doc		Rolf	**Brugger**	X		X				
074	CRUS_UseCase-ResearcherLeaving (EN).doc		Pierre	**L'Hostis**		X				X	
075	CRUS_UseCase-ResearcherLeaving-2 (EN+FR).doc		Pierre	**L'Hostis**	X	X				X	
076	CRUS_UseCase-SOR (EN).doc		Jan	**Melichar**		X		X		X	
077	CRUS_UseCase-SOR-2 (EN+FR).doc		Jan	**Melichar**	X	X		X		X	
078	CRUS_UseCase-Template_de_Koordinationsstelle.doc	Frau	Susanne	**Benitz**	X					X	
079	CRUS_UseCase-Template_eng_Description[Bibleikon].docx	Dr	Cecilia	**Griener Hurley**	X				X		
080	crus_usecase-template_v3 0 1_eng_description_cezanne.doc		Marie-Louise	**Cezanne**					X		
081	CRUS_UseCase-Template_v3 0_de_Beschreibung_PSI_data_management_2013_04_16 .doc		Stephan	**Egli**		X					
082	CRUS_UseCase-Template_v3 0_de_e-manuscripta.docx	Frau Dr.	Eva Martina	**Hanke**	X	X					
083	CRUS_UseCase-Template_v3 0_de_e-rara-ch.doc		Susanne	**Schneider**	X	X					
084	CRUS_UseCase-Template_v3 0_de_retro.seals.doc	Frau	Regina	**Wanger**	X	X					
085	CRUS_UseCase-Template_v3 0_de_Webportal-e-lib-ch.doc		Susanne	**Schneider**		X				X	
086	CRUS_UseCase-Template_v3-2.0_eng_[EBOOK_IBF].doc	Dr.	Elisabeth	**Liechti**	X				X		
087	CRUS_UseCase-Template_v3-2.0_eng_[MOOC_IBF].doc	Dr.	Elisabeth	**Liechti**	X				X		
088	CRUS_UseCase-Template_v3.0_de_BestPractices.doc	Frau	Regina	**Wanger**							

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
089	CRUS_UseCase-Template_v3.0_de_histbib-1_bereinigt.doc	Herr	Oliver	**Schihin**		X				X	
090	CRUS_UseCase-Template_v3.0_de_[CLOCKSS_Dark_Archive].doc	Herr Dr.	Matthias	**Töwe**	X	X					
091	CRUS_UseCase-Template_v3.0_de_[Digitales_Laborjournal].doc	Herr Dr.	Matthias	**Töwe**		X		X		X	
092	CRUS_UseCase-wordpress deployment.doc	Dr.	Radu	**Suciu**	X	X			X	X	
093	CRUS_UseCase-Template_v3.0_de_[eth_faessler_dahinden].doc	Dr.	Lukas	**Fässler**					X		
094	CRUS_UseCase-Template_v3.0_de_[Hosting_Nationallizenzen].doc	Herr Dr.	Matthias	**Töwe**	X	X					
095	CRUS_UseCase-Template_v3.0_de_[Kartenportal]_V02.doc	Herr	Jost	**Schmid**	X	X					
096	CRUS_UseCase-Template_v3.0_de_[Langzeitarchivierung-OA-Dokumente].doc	Frau	Barbara	**Hirschmann**	X	X					
097	CRUS_UseCase-Template_v3.0_de_[LOCKSS_Post_Cancellation_Access].doc	Herr Dr.	Matthias	**Töwe**	X	X					
098	CRUS_UseCase-Template_v3.0_de_[Lokales_Datenmanagement].doc	Herr Dr.	Matthias	**Töwe**	X	X				X	
099	CRUS_UseCase-Template_v3.0_de_[Portico_Preservation].doc	Herr Dr.	Matthias	**Töwe**	X	X					
100	CRUS_UseCase-Template_v3.0_de_[Schnittstellen_Langzeitarchiv].doc	Herr Dr.	Matthias	**Töwe**	X	X				X	
101	CRUS_UseCase-Template_v3.0_de_[Services_Langzeitarchivierung].doc	Herr Dr.	Matthias	**Töwe**		X					
102	CRUS_UseCase-Template_v3.0_de_[Tools_Content_Preservation].doc	Herr Dr.	Matthias	**Töwe**		X					
103	CRUS_UseCase-Template_v3.0_eng_Location-based_field_trip_support_and_games (1).doc		Marion R.	**Gruber**	X				X		X
104	CRUS_UseCase-Template_v3.0_eng_Metadata exchange_bereinigt.doc		Christian	**Gutknecht**							
105	CRUS_UseCase-Template_v3.0_eng_mobile_practicing_and_assessment.doc		Christian	**Glahn**	X		X		X		
106	CRUS_UseCase-Template_v3.0_eng_mobile_study_management_and_campus_information.doc		Anna	**Picco-Schwendener**		X	X		X	X	

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
107	CRUS_UseCase-Template_v3.0_eng_MUSE.doc	Prof.	Patrick	**Ruch**		X		X		X	
108	CRUS_UseCase-Template_v3.0_eng_SwissPMC.doc	Prof.	Patrick	**Ruch**	X	X				X	
109	CRUS_UseCase-Template_v3.0_eng_UC1-HarvestInstitutionalPublicationRepositories.doc		Christian	**Rohrer**	X	X					
110	CRUS_UseCase-Template_v3.0_eng_UC2-DirectDepositingOfResearchPublications.doc		Christian	**Rohrer**							
111	CRUS_UseCase-Template_v3.0_eng_UC3-ScientificObjectRepository.doc		Christian	**Rohrer**							
112	CRUS_UseCase-Template_v3.0_eng_[Description].doc	M. A.	Patrick	**Ryf**					X		
113	CRUS_UseCase-Template_v3.0_eng_[Keller-Eportfolio].doc		Stefan	**Keller**		X			X	X	
114	CRUS_UseCase-Template_v3.0_eng_[ORCID].doc		Barbara	**Hirschmann**	X		X				
115	CRUS_UseCase-Template_v3.0_fr_multivio.doc	RERO	Miguel	**Moreira**	X	X			X	X	
116	CRUS_UseCase-Template_v3.0_fr_RERO_APN.doc		Christian	**Pilloud**		X					
117	CRUS_UseCase-Template_v3.0_fr_[Datacenter-EPFL]20130409.doc	M.	Jean-Claude	**Berney**				X			
118	CRUS_UseCase-Template_v3.0_fr_[OpenAccess-landscape].doc	M.	Jean-Blaise	**Claivaz**	X						
119	CRUS_UseCase-Template_v3.0_fr_[SCOAP3].doc	M.	Jean-Blaise	**Claivaz**	X						
120	CRUS_UseCase-Toolbox.doc	Prof.	Bruno	**Wenk**						X	
121	CRUS_useCase-TotalAccess-UniFR.docx	Dr	Gérald	**Collaud**		X	X	X	X	X	
122	CRUS_UseCase-UNICloud_fr.doc	Professeure HES	Basma	**Makhlouf Shabou**		X		X			
123	CRUS_UseCase-UNIGE-BYOD.doc	Monsieur	Omar	**Benkacem**				X	X	X	
124	CRUS_UseCase-UNIGE-eCulture.doc	Monsieur	Omar	**Benkacem**					X		
125	CRUS_UseCase-UNIGE-Profile.doc	Monsieur	Laurent	**Opprecht**			X		X	X	
126	CRUS_UseCase-UNIGE-RE.doc	Monsieur	Omar	**Benkacem**		X		X	X	X	
127	CRUS_UseCase-UNIGE_Private_Computing_Cloud-en.doc	Dr	Jean-François	**Rossignol**		X		X			
128	CRUS_UseCase-UNIGE_Private_HPC_Cloud-en.doc	Dr	Jean-François	**Rossignol**		X		X			X
129	CRUS_UseCase-UNIL-bacup-replicates.doc	DR	Pascal	**Jacot-Guillarmod**		X					
130	CRUS_UseCase-VideoLearningPath (EN).doc	M	Cédric	**Bontron**		X		X	X		
131	CRUS_UseCase.v3-jermann.doc	Dr.	Patrick	**Jermann**					X		

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
132	CRUS_UseCaseIFeL_ePortfolio.docx	Prof.	Per	**Bergamin**			X		X	X	
133	CRUS_UseCaseIFeL_TeacherEducation.docx	Prof.	Per	**Bergamin**					X	X	
134	CRUS_UseCase_1c_NationalRepository_DirectDepositing OfResearchPublications_non_academic.doc	Monsieur	Nicolas	**Sartori**	X						X
135	CRUS_UseCase_APIAS_fr.doc	Professeure HES	Basma	**Makhlouf Shabou**		X		X			
136	CRUS_UseCase_AvivaChmiel_Unil.doc	Mme	Sugar Chmiel	**Aviva**					X	X	X
137	crus_usecase_CarolaBetzold.doc		Carola	**Betzold**	X	X					
138	CRUS_UseCase_E-Health-Literacy (Schlussversion 2013-04-19).docx	Herr Prof. Dr.	Urs	**Dahinden**	X				X	X	
139	CRUS_UseCase_E-learning_HTW_Chur.doc	Prof. Dr.	Bernard	**Bekavac**					X		
140	CRUS_UseCase_eCertificates.doc	Dr	Patrick	**Roth**			X		X		
141	CRUS_UseCase_FFHS2_mobilelog2.docx	Prof.	Per	**Bergamin**	X	X			X		X
142	CRUS_UseCase_FFHS3_cloud_IP.docx	Prof.	Per	**Bergamin**		X		X	X		
143	CRUS_UseCase_HSR_Aufbewahrung-Projektdaten.doc		Manuel	**Elgorriaga Kunze**		X	X	X			
144	CRUS_UseCase_HSR_GDI-GIS.doc		Manuel	**Elgorriaga Kunze**		X	X	X			
145	CRUS_UseCase_HSR_InternetVerkehrsdatenDB.doc		Eduard	**Glatz**		X		X			
146	CRUS_UseCase_HSR_QualityEngine.doc		Peter	**Bühler**			X	X	X		
147	CRUS_UseCase_HSR_Repository.doc		Mirko	**Stocker**		X	X	X			
148	CRUS_UseCase_HSR_Verwaltung-MSE.doc		Felix	**Huber**		X	X	X			X
149	CRUS_UseCase_HSR_Wandel-IT-Arbeit.doc		Manuel	**Elgorriaga Kunze**							X
150	CRUS_UseCase_IK_Kompetenzzentrum.doc	Frau	Brigitte	**Schubnell**	X	X			X	X	
151	CRUS_UseCase_Interoperability.doc	Dr	Patrick	**Roth**		X	X		X		
152	CRUS_UseCase_Rechte-Verlage-CH_20130403.doc	Frau	Silvia	**Witzig**	X					X	X
153	CRUS_UseCase_Scherly-Sohrman_v2.doc	Dr	Daniel	**Scherly**					X		
154	CRUS_UseCase_Science Box_bereinigt.doc	Head of "Researchers and Lecturers" Division	Konrad	**Jaggi**	X	X	X	X		X	

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
155	CRUS_UseCase_swissbib_20130405.doc	Herr	Tobias	**Viegener**		X				X	
156	CRUS_UseCase_SWITCH_Legal.doc		Esther	**Zysset**		X		X			X
157	CRUS_UseCase_UNIGE.doc	Dr.	Laurent	**Moccozet**					X		
158	CRUS_UseCase_Usability_HTW_Chur.doc	Prof. Dr.	Bernard	**Bekavac**	X	X			X	X	X
159	CRUS_UseCase_v3.0.1_eng_cloudsharedstorage.doc		Patrik	**Schnellmann**		X		X			
160	digital_learning_assisstant_T_Halbherr.docx	Mr.	Tobias	**Halbherr**					X	X	
161	docendo_M_Paschke.docx	Dr.	Melanie	**Paschke**	X				X	X	
162	E-Assessment_LMS_Process_Plugins_Signature_SEB_Th_Piendl.docx		Thomas	**Piendl**			X		X		
163	E-Assessment_SEB-Server-Service_Th_Piendl_bereinigt.doc		Thomas	**Piendl**					X		
164	Enhanced_Online-Exams_T_Halbherr.doc	Mr.	Tobias	**Halbherr**					X		
165	Enhancing_Assessment_Quality_T_Halbherr.doc	Mr.	Tobias	**Halbherr**					X		
166	EPFL-Description__donnees_recherche.doc		Didier	**Rey**		X					
167	EPFL_Storage_Ind_Coll_and_Research_Data.doc	Dr	Sofiane	**Sarni**		X					
168	EPFL__UseCase-Template_v3 0_eng_ScienceWise_bereinigt.doc	Dr.	Alexey	**Boyarsky**		X					
169	General_e-assessment_lifecycle.docx	Dr. sc. ETH	Philippe	**Zimmermann**					X		
170	HES-SO - Centralized archive system_bereinigt.doc		Daniel	**Plaschy**		X		X			
171	HES-SO - Digital portfolio_bereinigt.doc		Romain	**Voumard**			X	X			
172	HES-SO - Digital safe_bereinigt.doc		Hervé	**Le Pezennec**		X		X			
173	HES-SO - Digital signature for e-documents_bereinigt.doc		Hervé	**Le Pezennec**		X		X			
174	HES-SO - Open and collaborative platform for e-documents sharing_bereinigt.doc		Isidore	**Chirichiello**				X			
175	HES-SO - Swiss academic apps store_bereinigt.doc		Hervé	**Le Pezennec**				X			
176	HES-SO - Virtual class room_bereinigt.doc		Daniel	**Plaschy**		X		X			
177	HSLU - Experimental enterprise environment_bereinigt.doc		Armin	**Wehinger**				X		X	
178	Mahara_Teaching_Portfolio_B_Volk.docx	Dr.	Benno	**Volk**			X				X

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
179	Media Book Use Case v2.doc	Prof. Dr.	Andrea	**Back**	X				X	X	
180	Mini-Portfolios.doc	Lic. phil.	Elisabeth	**Berg**			X		X	X	
181	crus_usecase-template_v3 0 1_eng_description_lnxn.doc		Sebastian	**Linxen**					X	X	
182	Peer_Assessment_T_Halbherr.doc	Mr.	Tobias	**Halbherr**					X		
183	PKI_E-Assessment_E-Portfolio_Th_Piendl_bereinigt.doc		Thomas	**Piendl**			X		X	X	
184	SEB-Server-Enhancements_D_Schneider_bereinigt.docx		Daniel	**Schneider**					X		
185	SEB_for_Linux_Desktops_D_Schneider_bereinigt.docx		Daniel	**Schneider**					X		
186	SUPSI - Cloud data backup.doc		Mario	**Gay**		X		X			
187	SUPSI DACD - Geodata sharing and processing.doc		Massimiliano	**Cannata**		X		X			
188	SUPSI DACD - Library of making - Collaboration platform for supporting interactive prototyping_bereinigt.docx		Massimo	**Botta**					X	X	
189	SUPSI DACD - Research social network applications_bereinigt.docx		Massimo	**Botta**		X				X	
190	SUPSI DFA - Information literacy.doc		Luca	**Botturi**					X		X
191	SUPSI DFA - Mobile gaming services.doc		Luca	**Botturi**					X	X	
192	SUPSI DFA - Shared database for Harmos standardized tests.doc		Alberto	**Crescentini**		X					
193	SUPSI DTI - Multimedia editor for course materials.doc	Dr	Riccardo	**Mazza**	X				X		
194	SUPSI DTI IDSIA - Cloud-based sharing and semantic integration and provisioning of teaching and instructional material_bereinigt.docx	Postdoctoral Researcher	Sasa	**Nesic**		X	X	X	X		
195	Swissmetrics_bereinigt.doc	Prof. Dr.	Wolfgang	**Semar**	X	X					X
196	Tablets_Desktop_and_SEB_Use_D_Schneider_bereinigt.docx		Daniel	**Schneider**					X		
197	UC-Academic-App-Store.doc	Mr.	Simon	**Leinen**				X	X		
198	UC-Cloud-Storage.doc	Mr.	Simon	**Leinen**		X		X			
199	UC-Cloud-VM.doc	Mr.	Simon	**Leinen**				X			
200	Uscase AAV for teaching, learning and research.doc		Hansjörg	**Lauener**					X		X
201	Use Case IBF eAssessment.doc	Dr.	Peter	**Lautenschlager**					X		

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
202	Use Case_Gartenarchitektur_N_Stettler_bereinigt.doc	Prof. Dr.	Niklaus	**Stettler**		X					
203	Use Case_HTW_Kompetenznetzwerk fA¦èr Forschungsdatenmanagement.doc	Prof. Dr.	Rudolf	**Mumenthaler**		X				X	
204	Use Case_Multimediales Patientendossier Krebsbestrahlung_Edzard Schade_bereinigt.doc	Prof. Dr.	Edzard	**Schade**		X				X	
205	Use Case_Regionaljournal als wissenschaftliche Informationsressource_Edzard Schade_bereinigt.doc	Prof. Dr.	Edzard	**Schade**		X				X	
206	Use Case_Virtuelle Arbeitsplaetze fuer audiovisuelle Informationsressourcen_Edzard Schade_bereinigt.doc	Prof. Dr.	Edzard	**Schade**		X	X		X	X	
207	Use Case_Voelkerkundemuseum der Universitaet Zuerich_Edzard Schade_bereinigt.doc	Prof. Dr.	Edzard	**Schade**	X	X			X	X	
208	UseCase - Big Data Needs Structure_bereinigt.doc		Albert	**Weichselbraun**	X	X				X	
209	UseCase - OER-Suchmaschine.doc	Prof. Dr.	Wolfgang	**Semar**	X	X			X		
210	UseCase - Social Media_bereinigt.doc	Prof. habil. Dr	Albert	**Weichselbraun**	X	X				X	
211	UseCase - SwissImpact_bereinigt.doc	Prof. Dr.	Wolfgang	**Semar**	X	X					X
212	Usecase Academic Mediamanagement System.doc	M.Sc.	Hansjörg	**Lauener**		X			X		
213	Usecase Peer-Review.doc		Yvonne	**Seiler**					X	X	
214	Usecase Working Environment supporting the Collaborative Development of Learning Material.doc		Yvonne	**Seiler**		X			X	X	
215	UseCase-Ecole_la_Source.doc	Mme	Blanche	**Kiszio**	X	X		X		X	
216	UseCase-HEG_EconomyEnvironment.doc	Frau	Hélène	**Madinier**	X					X	
217	UseCase-HEG_Lizenzen.doc	Prof. Dr.	René	**Schneider**	X						
218	UseCase-HEG_LSD_bereinigt.doc	Prof. Dr.	René	**Schneider**	X	X				X	
219	UseCase-HEG_RCU_bereinigt.doc	Prof. Dr.	René	**Schneider**						X	X
220	UseCase-HEG_UnifiedRepositoryDiscovery.doc	Prof. Dr.	René	**Schneider**	X						
221	UseCase-HTW_Open Access-Bu¦êro_bereinigt.doc	Dr.	Karsten	**Schuldt**	X					X	
222	UseCase_CloudbasierteBibliotheken_bereinigt.doc	Dr.	Karsten	**Schuldt**						X	X
223	UseCase_DigitalisierungKleinerBesta¦ênde_bereinigt.doc	Dr.	Karsten	**Schuldt**		X					X
224	USECASE_FormativeAssessment.doc	Professor, Dean Faculty of Science	Michael	**Hengartner**					X		
225	UseCase_HistoricalCitationAnalysis_bereinigt.doc	Dr.	Karsten	**Schuldt**						X	

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
226	USECASE_MOOC_FacultyOfScience.doc	Professor, Dean Faculty of Science	Michael	**Hengartner**					X		
227	UseCase_personalisierter-Informationsdienst.doc	Prof. Dr.	Rudolf	**Mumenthaler**	X						
228	UseCase_RepositorienundForschungsdatenmanagement_bereinigt.doc	Dr.	Karsten	**Schuldt**		X					X
229	USI INF - Cloud productivity tools_bereinigt.doc		Mario	**Gay (on behalf of prof. Antonio Carzaniga)**		X		X		X	
230	USI INF - Repository of scientific publications_bereinigt.doc		Mario	**Gay (on behalf of prof. Antonio Carzaniga)**		X				X	
231	USI INF - Software reproducibility.doc		Rolf	**Krause**		X		X			
232	USI INF - Web-based storage.doc		Rolf	**Krause**		X	X	X			
233	Videoannotation Use case 1.doc	Dr. med.	Ulrich	**Woermann**					X	X	
234	Videoannotation Use case 2.doc	Dr. med.	Ulrich	**Woermann**					X	X	
235	Videoannotation Use case 3.doc	Dr. med.	Ulrich	**Woermann**					X	X	
236	ZFH_UseCase_EntwicklungsPortfolio_Hippold.doc	M.A	Ilona	**Hippold**			X	X	X	X	
237	ZFH_UseCase_ePortfolio_Guetersloh.doc		Christoph	**Gütersloh**	X		X		X	X	
238	ZFH_UseCase_eSript_Guetersloh.doc		Christoph	**Gütersloh**	X				X	X	
239	ZFH_UseCase_Mooc_Kauf.doc	Dr.	Peter	**Kauf**					X		X
240	ZFH_UseCase_Schnittstelle_LMS_Sharepoint_Fraevel.doc		Jürg	**Fraefel**					X		
241	ZFH_UseCase_SelbstgesteuertesLernen_Lim.doc		Urban	**Lim**		X			X	X	
242	ZFH_UseCase_sMOOC_Hodel.doc		Urs	**Hodel**	X				X	X	
243	ZFH_UseCase_VideoAnnotation_Fraevel.doc		Jürg	**Fraefel**					X		
244	ZFH_USI_UseCase_LegalChallenges_Witzig_Schwender.docx		Samuel Anna	**Witzig Picco-Schwendener**	X	X	X	X	X	X	
245	ZHF_UseCase_Biotechnology_Kovar.doc	Prof. Dr.	Karin	**Kovar**		X			X	X	X
246	ZHF_UseCase_eScript_Lozza.doc		Daniela	**Lozza**	X				X	X	

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
247	ZHF_UseCase_LiveLongLearning_Lozza.doc		Daniela	**Lozza**			X		X	X	
248	ZHF_UseCase_workbook_Merlo.doc	Dr.	Olivier	**Merlo**	X				X	X	X
249	CRUS_UseCase-ZHdK_Medienarchiv.doc	Frau	Susanne	**Schumacher**		X		X			
250	CRUS_UseCase-4P-DB.doc	Herr Dr.	Christoph	**Baumgarten**	X	X	X	X		X	
251	CRUS_UseCase-CentralIdentity.doc	Herr Dr.	Christoph	**Baumgarten**		X	X			X	
252	CRUS_Unidistance_PSY_ELearning_UseCase1_bereinigt.doc	Pr. Dr.	Gaëlle	**Molinari**					X		
253	CRUS_Unidistance_PSY_ELearning_UseCase2_bereinigt.doc	Pr. Dr.	Gaëlle	**Molinari**					X		
254	CRUS_UseCase-2013_eLML_bereinigt.doc		Immo	**Wille**	X	X			X	X	
255	CRUS_UseCase-GoldRoad-OA-Publikationsgebuehren.docx	Prof. Dr.	Christian	**Fuhrer**	X						
256	CRUS_UseCase-Template_v3 0_eng_edulap_20130325_bereinigt.doc	Prof. Dr. phil.	Damian	**Läge**		X			X		
257	CRUS_UseCase-Template_v3.0_eng_[Agent-Programmable Personal Learning Environment]_bereinigt.doc	Prof. Dr.	Helmar	**Burkhart**				X	X	X	
258	CRUS_UseCase_FFHS1_DistriPro_bereinigt.doc	Prof.	Per	**Bergamin**	X	X			X	X	
259	CRUS_UseCase_Unige_Unidistance_final_v2_bereinigt.doc	Professors	Olivier; Ulrich	**Desrichard; Frauenfelder**		X	X		X	X	
260	EGONE gynecologie suisse_bereinigt.doc	Prof. Dr. med	Urs	**Haller**					X		
261	Electronic evaluation-checklists_bereinigt.doc	Dr. sc. ETH	Philippe	**Zimmermann**					X		
262	FarberKappeler_bereinigt.doc	Professor Professor	Thomas Michael	**Kappeler Farber**		X			X		
263	Plateforme_Simulation_Seriousgames_bereinigt.doc	Professor	Dominique	**Jaccard**					X	X	
264	Student Voice - PH FHNW_bereinigt.doc		Ricarda T.D.	**Reimer**					X		
265	Swiss TPH-CRUS_UseCase-Template_v3.0_eng_[Description]_bereinigt.doc	Dr.	Axel	**Hoffmann**					X		X
266	Use Case - OER - PH FHNW_bereinigt.doc		Ricarda T.D.	**Reimer**					X		
267	CRUS_UseCase-Swiss-Academic-Publisher.docx	Frau / Herr	Franziska / Dirk	**Moser / Verdicchio**	X						

Anwendungsfall		Einreichende Person			Durch die einreichende Person definiertes Handlungsfeld						
ID	Dateiname / Titel	Anrede	Vorname	Name	e-Publishing	Data Managment	Identity Managment	Cloud Computing	e-Learning	Working Environment	Andere
268	CRUS_UseCase_Open_Access_Competence_center.docx		Franziska Moser / Silvia Witzig / Dirk Verdicchio		X						X
269	A_CRUS_UseCase_Rich_Media_Collab_UNILv3.doc		Nadia, Emmanuel, Marc	**Spang Bovey, Fernandes, Sohrmann**							

Annex D Description of function blocks

The description of the function blocks is based exclusively on the requirements ascertained from the 269 use cases submitted and, as such, is a snapshot in time for the purposes of Strategy Phase 1.

D.1 Identity management function blocks

No.	Name
F-IM-1	**Functions for an e-sic identity**
	Description:
	▪ With an e-identity, a person can retain a personal login as an alumnus after completing a course of study, as a means of subsequent personal authentication and authorization (lifelong identity). ▪ An e-identity serves, for instance, as the basis for accessing resources for further training after a person completes their studies (lifelong learning) ▪ This consistent identity is an essential requirement for the national services.
	Main functionalities:
	▪ Personal, lifelong e-identity ▪ Management of e-identities ▪ Services for the use of personal authentication and authorization
	Derived from the following use cases:
	▪ 013, 040, 048, 051, 052, 054, 057, 066, 068, 073, 107, 110, 114, 120, 131, 151, 155, 159, 162, 178, 217, 247, 251
	Existing projects and services based on the use cases:
	▪ 040, Identité Académique Numérique ▪ 048, 073, 110, 114, ORCID, www.orcid.org ▪ 054, SuisseTrust IAM, http://hitech.bfh.ch/de/archiv/hitech_12013/focus/suisse_trust_iam.htm ▪ 054, 066, 155, 181, 217, 251, SWITCHaai, www.switch.ch ▪ 066, SSO Private IdP ▪ 068, Identité Académique Numérique, Portable Traces, www.portabletraces.ch ▪ 247, e-identity

No.	Name
F-IM-2	**Functions for authentication, authorization and accounting**
	Description:
	▪ Directory service for authenticating and authorizing users by centrally allocating roles and assigning organizational units, which can be used generically and in any application. ▪ For each organizational unit
	Main functionalities:
	▪ Central definition of user groups ▪ Central allocation of roles and rights
	Derived from the following use cases:

	▪ 003, 013, 016, 018, 025, 027, 051, 052, 054, 091, 110, 117, 125, 127, 128, 143, 144, 145, 146, 147, 148, 167, 169, 172, 177, 249, 250, 251
	Existing projects and services based on the use cases:
	▪ SWITCHaai, www.switch.ch ▪ 016, openID, OrchID ▪ 025, Identité accadémique numérique - Unige.11 ▪ 110, ORCID (http://orcid.org)

No.	Name
F-IM-3	**Linkup function for electronic identities**
	Description:
	▪ Standard platform for identity management at Swiss higher education institutions, which works by sharing the task of identity and attribute management for a person/user among various institutions (chiefly universities). ▪ Central and university services can be connected to the national identity platform for authentication and authorization purposes. ▪ Connection to international identity platforms
	Main functionalities:
	▪ Personal, overall national identity and access management ▪ Connection to international scientific federated identity management platforms ▪ Management of identities both nationally and internationally ▪ Supporting international efforts (standards) in federated identity management
	Derived from the following use cases:
	▪ 040, 052, 053, 073, 106, 110
	Existing projects and services based on the use cases:
	▪ 040, Identité Académique Numérique ▪ 053, SWITCHaai: www.switch.ch, eduGain, Umbrella Pilot Projekt EU Stufe: http://pan-data.eu; http://www.crisp-fp7.eu; https://umbrella.psi.ch/euu/ ▪ 073, Open Researcher and Contributor ID (ORCID): http://orcid.org/

No.	Name
F-IM-4	**Electronic signature functions**
	Description:
	▪ Central body for the management, issue and validation of certificates. The signature uniquely identifies the signatory and ensures the integrity of data.
	Main functionalities:
	▪ Issue of certificates ▪ Provision of tools for the use (e.g. electronic signature) and validation of certificates ▪ Best practices and guidelines on handling certificates ▪ Unique identification of the signatory ▪ Ensuring data integrity
	Derived from the following use cases:
	▪ 033, 140, 145, 162, 173, 183, 184
	Existing projects and services based on the use cases:
	▪ None

No.	Name
F-IM-5	**User usage functions**
	Description:
	▪ Allocated resources (e.g. individually used processing power, memory capacity requirements, other services) are measured as a basis for reciprocal charging for services made available nationwide.
	Main functionalities:
	▪ User identification on the basis of unique electronic identities (personal) ▪ Measurement of service usage, preparation of statistics and specific analyses.
	Derived from the following use cases:
	▪ 018, 145, 210
	Existing projects and services based on the use cases:
	▪ None

D.2 Working environment function blocks

No.	Name
F-WE-1	**Portal functions**
	Description:
	▪ A service portal is a web-based application which serves the user as a directory of the available services (applications). It is conceivable that the services listed in the service portal can be started directly from the portal. ▪ The portal serves as a central point of access to the national services. ▪ In theory, more complex services, such as the provisioning of a software instance (SaaS) or a virtual computing resource (IaaS) can be integrated.
	Main functionalities:
	▪ Authentication of users and user profiles ▪ Data model for structuring and describing the services ▪ Integration of services with different interaction levels (basic catalog, redirect to service, direct integration of the service in the service portal) ▪ Multi-client capability (local services/information, national services)
	Derived from the following use cases:
	▪ 085, 091, 106, 154, 155, 159, 177
	Existing projects and services based on the use cases:
	▪ 085, www.e-lib.ch ▪ 154, SWITCHtoolbox (https://toolbox.switch.ch) ▪ 155, www.swissbib.org, www.swissbib.blogspot.com

No.	Name
F-WE-2	**Functions for personalization**
	Description:
	▪ A personalized environment can be made available by a service portal and enables the user, by managing a profile, to filter the available information and services according to his personal interests and, in so doing, individualize the portal.
	Main functionalities:
	▪ Management of a user profile (interests, courses etc.) ▪ Suggesting information sources which might be of interest to the user, based on his profile ▪ Integration of e-mail, surveys, LMS ▪ Integration of recommendations regarding publications ▪ Personal learning support (peer networks, learning plans, good practice) ▪ Integration of social networks
	Derived from the following use cases:
	▪ 106, 123, 126, 131, 150, 152, 160, 168, 219, 227
	Existing projects and services based on the use cases:
	▪ None

No.	Name
F-WE-3	**Functions for the preparation of a personal portfolio**
	Description:
	▪ Central platform for filing personal academic data such as career, references, degrees and diplomas, credits, education, research findings, publications etc. and making them available to third parties.
	Main functionalities:
	▪ Management of contact and profile data, publications, references, degrees and diplomas and other forms of proof of skills ▪ Making a personal portfolio available to third parties.
	Derived from the following use cases:
	▪ 001, 029, 040, 057, 059, 068, 092, 132, 140, 148, 171, 178, 180, 230, 234, 236, 258, 259
	Existing projects and services based on the use cases:
	▪ 029, 140, Learning Infrastructure 2013, WP 1.4, 1.5, 3.2 and former AAA PLE and eID projects ▪ 040, 068, Identité Académique Numérique ▪ 057, 059, SWITCHportfolio, http://www.switch.ch/de/uni/projects/eidentity/eportfolio.html ▪ 059, Planet Fellows ▪ 236, Mahara ▪ 259, Portfolio@unige.ch

No.	Name
F-WE-4	**Functions for mobility**
	Description:
	▪ Access to all kinds of services on mobile platforms (smartphones, tablets etc.) via appropriate user interfaces (web-based or native applications). ▪ Exploiting all the possibilities offered by the new mobile devices.
	Main functionalities:
	▪ Access to user content / personal storage ▪ Access to collaboration platform ▪ Access to learning management systems ▪ Client software for Windows, Mac OS X, Linux, iOS, Android ▪ Integration with mobile device management ▪ Supports multiple languages (DE, FR, IT, EN)
	Derived from the following use cases:
	▪ 064, 106, 123, 159, 160, 169, 170, 184, 196, 254, 266
	Existing projects and services based on the use cases:
	▪ None

No.	Name
F-WE-5	**Collaboration functions**
	Description:
	▪ A collaboration platform is a group of applications which make available to the user or a user group functionalities for electronic collaboration. ▪ The main features are the joint preparation and sharing of content and coordination of joint tasks.
	Main functionalities:
	▪ Wikis ▪ Calendar / mail ▪ e-meetings ▪ Social collaboration ▪ Project spaces
	Derived from the following use cases:
	▪ 001, 002, 003, 027, 031, 057, 091, 092, 107, 120, 145, 160, 161, 166, 174, 180, 181, 188, 189, 202, 210, 216, 229, 236, 247, 253, 258, 266, 269
	Existing projects and services based on the use cases:
	▪ 001, wiki.systemsx.ch ▪ 003, https://sympa.ethz.ch ▪ 057, SWITCHportfolio, http://www.switch.ch/de/uni/projects/eidentity/eportfolio.html ▪ 120, SWITCHtoolbox, https://toolbox.switch.ch

No.	Name
F-WE-6	**Functions for an e-sic app store (user self-service, Software as a Service)**
	Description:
	▪ A Software as a Service infrastructure enables instances of applications to be provisioned/instanced and made available without the user having to set up the necessary infrastructure. ▪ A self-service portal (app store) is operated which grants access to these applications and in which national services can be purchased centrally.
	Main functionalities:
	▪ Catalog for describing and managing services ▪ Possibility for the user to automatically provision (instance) services ▪ Integrated billing of chargeable services
	Derived from the following use cases:
	▪ 005, 010, 012, 015, 020, 056, 069, 081, 127, 131, 143, 175, 191, 197, 222, 224, 238, 245, 246, 247
	Existing projects and services based on the use cases:
	▪ SWITCHtoolbox *Other projects and services:* ▪ Possible SaaS applications: o Reservation system for instruments (012) o Alpine3D (020) o Personal Research Environment (PRE) (069)

No.	Name
F-WE-7	**Personal filing functionalities**
	Description:
	▪ Personal virtual data filing for saving documents and other content. ▪ The owner of the data may allow other people to access the data.
	Main functionalities:
	▪ Filing and management of data (documents, memos etc.) ▪ Quick and flexible recovery of the data ▪ Access anytime, anywhere
	Derived from the following use cases:
	▪ 042, 057, 058, 069, 167, 170, 246
	Existing projects and services based on the use cases:
	▪ 057, SWITCHportfolio, http://www.switch.ch/de/uni/projects/eidentity/eportfolio.html ▪ 167, myNAS

No.	Name
F-WE-8	**Workspace and file sharing functions**
	Description:
	▪ Virtual data filing for saving documents and other content and making them accessible. ▪ The content managed in the virtual data filing system can be accessed from any device at any time, irrespective of location.
	Main functionalities:
	▪ Filing and management of data (documents, memos etc.) ▪ Quick and flexible recovery of the data ▪ Access anytime, anywhere ▪ The administrator is responsible for approving access for additional users
	Derived from the following use cases:
	▪ 001, 011, 042, 058, 091, 098, 120, 142, 154, 159, 167, 172, 174, 180, 189, 194, 229, 232, 258
	Existing projects and services based on the use cases:
	▪ 057, SWITCHportfolio, http://www.switch.ch/de/uni/projects/eidentity/eportfolio.html ▪ 120, SWITCHtoolbox, https://toolbox.switch.ch ▪ 167, myNAS

No.	Name
F-WE-9	**Search functionality**
	Description:
	▪ Search module with the facility to search several different information sources at once. This includes, for example, search systems for multimedia open educational resources (OER) files.
	Main functionalities:
	▪ Information sources within and outside the organization ▪ Basic and advanced searches (metadata and full text search) ▪ Federated search ▪ Faceted search ▪ Semantic clustering ▪ Visualization forms
	Derived from the following use cases:
	▪ 085,155, 209, 216, 218, 220, 257
	Existing projects and services based on the use cases
	▪ 085, Webportal e-lib, www.e-lib.ch ▪ 155, Webportal swissbib, www.swissbib.ch ▪ 216, Infonet Economy, http://www.infonet-economy.ch ▪ 218, RODIN (ROue D'INformation)

No.	Name
F-WE-10	**Data analysis functions**
	Description:
	▪ Infrastructure for analyzing and visualizing large quantities of scientific research data. ▪ Potential for further development, i.e. recognition of overlap (i.e. across several, independent research results/projects)
	Main functionalities:
	▪ Data mining and reporting ▪ Browsing saved scientific research data ▪ Statistical analyses and simulations ▪ Option of using standard software for processing and analysis
	Derived from the following use cases:
	▪ 018, 041, 081, 145, 195, 208, 211, 225
	Existing projects and services based on the use cases
	▪ 018, A4-Mesh, http://a4-mesh.unibe.ch ▪ 081, PSI: Online und offline Datenanalyse

D.3 Publishing function blocks

No.	Name
F-eP-1	**Digitization functions**
	Description:
	▪ Analog content (e.g. paper documents, images etc.) are digitized by being scanned and can then be processed in electronic form. ▪ Digitization also supports functionalities for recording metadata and for classifying content, for OCR (optical character recognition) and for quality assurance during the digitization process. ▪ Additional information systems can be integrated for the further processing or filing of the digital copy.
	Main functionalities:

	▪ Digitization (scanning) of analog content and quality assurance
	  o 2D content such as paper documents and images
	  o 3D content such as 3D models
	▪ Recording metadata and classifying content
	▪ Optical character recognition for text content
	▪ Quality assurance during the digitization process
	▪ Integration of information systems for further processing/filing digital copy

	Derived from the following use cases:
	▪ 035, 039, 079, 082, 083, 084, 088, 090, 094, 096, 097, 223
	Existing projects and services based on the use cases:
	▪ 079, Scholarly archive Part II / Scholarly Archive Part III ▪ 082, e-rara.ch, e-manuscripta.ch ▪ 084, retro.seals.ch ▪ 088, Best Practices Digitalisierung

No.	Name

F-eP-2	**Open access**
	Description:
	▪ Facilitating open access through central coordination of the necessary legal, political and infrastructural parameters.
	Main functionalities:
	▪ National platform to support open access publications ▪ Open access publishing
	Derived from the following use cases:
	▪ 048, 067, 104, 109, 114, 118, 119, 134, 152, 211, 221, 250 255, 267, 268
	Existing projects and services based on the use cases:
	▪ 119, SCOAP3 ▪ 134, RERO DOC ▪ 152, SHERPA, RoMEO, ZORA ▪ Open Access Policy der Universität St.Gallen ▪ 250, Forschungsplattform Alexandria, http://www.alexandria.unisg.ch ▪ 255, Mitgliedschaften bei Open Access-Verlagen, Publikationsfonds ▪ 276, Open Journal Systems

No.	Name
F-eP-3	**License management**
	Description:
	▪ Acquisition of national licenses for publications. ▪ Switzerland's higher education institutions must have the same access to all nationally licensed content.
	Main functionalities:
	▪ Central purchasing, management and updating of licenses acquired
	Derived from the following use cases:
	▪ 037, 038, 060, 094, 099, 217, 258
	Existing projects and services based on the use cases:
	▪ 037, 217, Konsortium der Schweizer Hochschulbibliotheken (CSAL) ▪ 099, Portico, http://www.portico.org/digital-preservation/join-portico/for-libraries

No.	Name
F-eP-4	**Functions for national publication catalogs**
	Description:
	▪ Comprehensive and straightforward access to all scientific publications held by Swiss higher education institution libraries, through a shared platform. ▪ Management of various collections (e.g. historical collections) ▪ Metadata search
	Main functionalities:
	▪ Open Archive Initiative – Protocol for Metadata Harvesting (OAI-PMH) ▪ Service requester functionality for overall metadata harvesting and for metadata searches
	Derived from the following use cases:

	▪ 036, 089, 105, 110,155, 222
	Existing projects and services based on the use cases:
	▪ 036, Jusbib ▪ 155, e-lib, e-lib.ch, swissbib, www.swissbib.ch

D.4 e-Learning function blocks

No.	Name
F-eL-1	**Functions for a personal learning environment (PLE)**
	Description:
	▪ A personal learning environment (PLE) enables personalized access to learning content and catalogs.
	Main functionalities:
	▪ Overview of personal curriculum (catalog), personalized access to learning catalog ▪ e-learning functionalities ▪ Course documents ▪ Interface with assessments
	Derived from the following use cases:
	▪ 024, 056, 065, 080, 086, 093, 112, 130, 131, 139, 141, 151, 153, 176, 179, 181, 200, 236, 240, 243, 247, 248, 257, 264
	Existing projects and services based on the use cases:
	▪ 056, 065, PLE UNIGE, http://ple.unige.ch/index.html ▪ 080, Moodle Lernplattform der ZHAW, http://moodle.zhaw.ch/ ▪ 112, Fernstudium Theologie ▪ 236, Mahara

No.	Name
F-eL-2	**Mobile learning functionality**
	Description:
	▪ Whilst mobile platforms (smartphones, tablets etc.) open up new possibilities in terms of teaching methods, they also create new demands in terms of the provision of content. Content must be optimized for mobile devices and the latest technological advances exploited.
	Main functionalities:
	▪ Provision of learning content for mobile devices ▪ Tools for creating learning content for mobile devices
	Derived from the following use cases:
	▪ 063, 064, 070, 086, 103, 105, 106, 123, 141, 179, 234, 235, 238, 245, 248
	Existing projects and services based on the use cases:
	▪ 063, Mobile Uni App, http://ccmb.iwi.unisg.ch/projects/project-mobile-uni-app/ ▪ 063, 064, SWITCH AAA: Learning Infrastructure. Mobility and Ubiquity resources for learners and teachers ▪ 105, Mobler Cards ▪ 179, Mobile Business Tablet Book

No.	Name
F-eL-3	**Learning portfolio (training catalog)**
	Description:
	▪ Courses and content can be viewed and booked in a learning portfolio.
	Main functionalities:
	▪ List of current courses (general and personalized) ▪ Registration for courses
	Derived from the following use cases:
	▪ 093, 136, 151, 237, 253
	Existing projects and services based on the use cases:
	▪ 237, Mahara

No.	Name
F-eL-4	**Assessment functions**
	Description:
	▪ Electronic staging of exams
	Main functionalities:
	▪ Platform for electronic exams that are eligible for appeal ▪ Writing, staging and marking exams
	Derived from the following use cases:
	▪ 023, 032, 049, 093, 105, 131, 153, 157, 162, 163, 164, 169, 182, 184, 185, 201, 213, 233, 261, 269
	Existing projects and services based on the use cases:
	▪ 093, SIOUX, http://www.cta.ethz.ch ▪ 105, Mobler Cards ▪ 162, Moodle, ILIAS ▪ 163, 184, 185, SEB Server, http://www.safeexambrowser.org ▪ 213, ILIAS ▪ 261, e-OSCE System (OSCE: Objective Structured Clinical Examination)

No.	Name
F-eL-5	**Learning management system (administration)**
	Description:
	▪ A learning management system comprises all the basic functionalities for the administration of teaching, such as the management of catalogs, courses and participants.
	Main functionalities:
	▪ Management of catalog, courses and participants
	Derived from the following use cases:
	▪ 034, 103, 105, 130, 136, 141, 153, 155, 161, 179, 193, 194, 214, 253, 254, 262, 263, 269

	Existing projects and services based on the use cases:
	▪ 034, BPMN 2.0 for modeling educational workflows ▪ 153, Cas cliniques interactifs ▪ 161, Online learning material Sustainable Plant Systems ▪ 261, Decendo ▪ 263, Web Game Authoring System (WEGAS), http://www.albasim.com/fr/solutions-fr/wegas

No.	Name
F-eL-6	**Learning content management system (content and storage)**
	Description:
	▪ Course descriptions and course content are created in the learning content management system and managed during their active life cycle. The LCMS serves as a basis for the subsequent archiving of the content in an electronic permanent archive.
	Main functionalities:
	▪ Management of course descriptions ▪ Preparation of course content ▪ Management of course content
	Derived from the following use cases:
	▪ 025, 027, 042, 046, 047, 064, 070, 086, 105, 106, 130, 133, 161, 190, 191, 193, 209, 212, 241, 254, 256, 258, 259, 262, 266
	Existing projects and services based on the use cases:
	▪ 130, mediaserver.unige.ch ▪ 161, Online learning material Sustainable Plant Systems, Decendo ▪ 191, Games4Learning ▪ 256, Educational Landscape Psychology (edulap), www.edulap.ch ▪ 266, SWITCHcollection, https://collection.switch.ch

No.	Name
F-eL-7	**Functions for massive open online courses (MOOC)**
	Description:
	▪ Massive open online courses are courses that are held online and which can attract large numbers of participants. ▪ MOOC can be based on conventional courses recorded on video, which can be retrieved online, or can be staged live, with the involvement of the participants (interactive). The latter format requires special information systems.
	Main functionalities:
	▪ Scaleable online course platform (MOOCs concept) ▪ Electronic collaboration ▪ Online research literature ▪ Video sharing ▪ Access to additional information sources
	Derived from the following use cases:
	▪ 030, 031, 033, 087, 131, 226, 239, 242, 252

	Existing projects and services based on the use cases:
	▪ 030, HES-SO Moodle “Moocisation” (MOODEC) ▪ 031, SWITCHcast, Mahara ▪ 033, Graasp, https://graasp.epfl.ch ▪ 131, Center for Digital Education ▪ 239, Applying Podcasts in Mathematics

No.	Name
F-eL-8	**Video management and annotation functions**
	Description:
	▪ Special feature: video-based learning and assessment
	Main functionalities:
	▪ Upload for authorized user groups ▪ Management of object metadata ▪ Adding comments and annotations to videos ▪ Search function ▪ Sophisticated presentation which can also be incorporated in external systems (e.g. ILIAS) ▪ Management of the objects themselves: e.g. objects could belong to several groups (“playlists”). ▪ Actions could be carried out within these groups, e.g. assign a group to an external system, or a particular LMS course (ILIAS, Moodle) ▪ Categorization (e.g. for the subject-based presentation of objects, all objects from certain groups, etc.)
	Derived from the following use cases:
	▪ 023, 024, 181, 200, 212, 233, 234, 243, 253, 269
	Existing projects and services based on the use cases:
	▪ 023, 024, 200, 233, 234, SWITCHcast iVT und AAV ▪ 200, AAA Projekte ETHZ.9 und ETHZ.10, Matterhorn ▪ 243, Video Annotating Tool

D.5 Data management function blocks

No.	Name
F-DM-1	**Data life cycle functions**
	Description:
	▪ Documents and files can be managed in a standard manner, in accordance with the relevant legal and other requirements throughout their life cycle, from creation to deletion.
	Main functionalities:
	▪ Set of rules for data management throughout the life cycle of the data ▪ Categorization of data based on the characteristics ▪ Management and deletion of data ▪ Conversion of formats
	Derived from the following use cases:

	▪ 044, 050, 074, 075, 081, 091, 100, 101, 102, 111, 137, 166, 167, 172, 174, 244
	Existing projects and services based on the use cases:
	▪ 050, IT Science Services ▪ 075, Archivage long-terme (Archives FPSE) ▪ 100, 101, Digitaler Datenerhalt ETH Zürich, http://www.library.ethz.ch/de/Ueber-uns/Projekte/Digitaler-Datenerhalt ▪ 166, Gestion des données de recherche

No.	Name
F-DM-2	**Metadata**
	Description:
	▪ In addition to the actual data, metadata must also be stored and updated, to fulfill the requirements in regard to data management throughout their life cycle and requirements that may be imposed by interfaces and other standards. ▪ The overriding aims with regard to interoperability and data quality can be achieved by defining shared conceptual data models and the necessary metadata concepts derived from them. ▪ The task of defining and updating suitable metadata is directly linked with the option of opening and reusing data and documents by means of structured search queries.
	Main functionalities:
	▪ Description of the data model and metadata ▪ Provision of the metadata catalogs ▪ Importing and exporting metadata ▪ Guarantees compliance with international standards
	Derived from the following use cases:
	▪ 036, 044, 045, 050, 104, 109, 111, 126, 144, 161, 168, 249
	Existing projects and services based on the use cases:
	▪ 144, Zentrale Geodateninfrastruktur (GDI), www.e-geo.ch ▪ 168, ScienceWISE

No.	Name
F-DM-3	**Functions for an open archival information system (OAIS)**
	Description:
	▪ Platform for the creation and operation of OAIS-compliant archive systems for the long-term retention of electronic data. ▪ Because services are provided centrally, functionalities that have already been implemented can be reused and stored in a number of OAIS-compliant repositories/archives (e.g. conversion services)
	Main functionalities:
	▪ Services in the spheres of ingest, administration, data management, archival storage and access which meet the OAIS requirements.
	Derived from the following use cases:
	▪ 061, 062, 075, 096, 098, 100, 116, 135

	Existing projects and services based on the use cases:
	▪ 061, 062, Bern University Library workflow for archiving digital objects in the institutional repository ▪ 075, Archives FPSE ▪ 096, 098, 100, Digitaler Datenerhalt ETH Zürich, http://www.library.ethz.ch/de/Ueber-uns/Projekte/Digitaler-Datenerhalt ▪ 116, RERO-DLM

No.	Name
F-DM-4	**e-Archive research**
	Description:
	▪ Electronic archive for the long-term retention of primary research data (scientific object repository, SOR).
	Main functionalities:
	▪ Ingest of research data ▪ Retention and management of research data ▪ Granting and management of access rights
	Derived from the following use cases:
	▪ 009, 018, 050, 062, 076, 081, 091, 096, 101, 102, 107, 111, 115, 120, 137, 144, 145, 154, 161, 167, 187, 198, 202, 228, 231, 249, 250
	Existing projects and services based on the use cases:
	▪ 050, IT Science Services ▪ 062, Bern University Library workflow for archiving digital objects in the institutional repository ▪ 081, Swiss Light Source (SLS) ▪ 096, Digitaler Datenerhalt ETH Zürich, http://www.library.ethz.ch/de/Ueber-uns/Projekte/Digitaler-Datenerhalt ▪ 115, Multivio, http://multivio.org ▪ 144, HSR GDI ▪ 154, SWITCHtoolbox, https://toolbox.switch.ch ▪ 167, myNAS ▪ 187, Helidem, PERNAT ▪ 198, SWITCH BCC (Building Cloud Competence) ▪ 202, Garden Memory goes Public. ▪ 249, Medienarchiv der Zürcher Hochschule der Künste (ZHdK), http://medienarchiv.zhdk.ch ▪ Additional project: SAGW's DDZ project (retention of humanities research data), http://www.sagw.ch

No.	Name
F-DM-5	**e-Archive educational data**
	Description:
	▪ Electronic archive for the long-term retention of educational data ▪ Exam results/assessments ▪ Degrees, diplomas and other certificates ▪ Other relevant documents

	Main functionalities:
	▪ Ingest of educational data ▪ The relevant data cannot be amended ▪ Retention and management of educational data ▪ Granting and management of access rights
	Derived from the following use cases:
	▪ 062, 143, 198, 249
	Existing projects and services based on the use cases:
	▪ 062, Bern University Library workflow for archiving digital objects in the institutional repository ▪ 143, HSR Longterm Backup ▪ 198, SWITCH BCC (Building Cloud Competence) ▪ 249, Medienarchiv der Zürcher Hochschule der Künste (ZHdK), http://medienarchiv.zhdk.ch

No.	Name
F-DM-6	**e-Archive library/publications**
	Description:
	▪ Electronic archive for the long-term retention of scientific publications and collections
	Main functionalities:
	▪ Ingest of publications and collections ▪ Retention and management of publications and collections ▪ Granting and management of access rights
	Derived from the following use cases:
	▪ 014, 038, 055, 062, 084, 090, 094, 097, 101, 110, 134, 143, 167, 198, 202, 207, 230, 249, 250
	Existing projects and services based on the use cases:
	▪ 055, infoclio.ch - Portail professionnel pour les sciences historiques en Suisse ▪ 062, Bern University Library workflow for archiving digital objects in the institutional repository ▪ 084, Digitalisierte Zeitschriften, retro.seals.ch ▪ 097, Einführung von LOCKSS (Lots of Copies Keep Stuff Safe) ▪ 101, Digitaler Datenerhalt ETH Zürich, http://www.library.ethz.ch/de/Ueber-uns/Projekte/Digitaler-Datenerhalt ▪ 134, RERO DOC, http://doc.rero.ch ▪ 143, HSR Longterm Backup ▪ 198, SWITCH BCC (Building Cloud Competence) ▪ 250, HSG Forschungsplattform Alexandria, http://www.alexandria.unisg.ch ▪ 249, Medienarchiv der Zürcher Hochschule der Künste (ZHdK), http://medienarchiv.zhdk.ch

D.6 Cloud computing function blocks

No.	Name
F-CC-1	**On demand server infrastructure (Infrastructure as a Service)**
	Description:
	▪ With a virtual server infrastructure, processing power can be used on an ad hoc, flexible basis in the form of virtual servers. ▪ Virtual servers can be configured by the user and provisioned by entering the necessary attributes (CPU capacity, storage requirements etc.) ▪ When the server is no longer required, the resources can be released.
	Main functionalities:
	▪ Portal for access to, and administration of, the server infrastructure ▪ Access management/user administration ▪ Infrastructure maintenance ▪ Training in using the infrastructure
	Derived from the following use cases:
	▪ 005, 007, 013, 017, 021, 041, 117, 127, 130, 131, 143, 177, 199
	Existing projects and services based on the use cases:
	▪ 005, 117, CSCS, www.cscs.ch ▪ 007, Academic Compute Cloud Provisioning and Usage project, hobbes at UZH, octavius at ETH ▪ 013, Swiss Multi Science Computing Grid SMSCG ▪ 017, VM-MAD ▪ 021, Swiss WLCG, CREAM CE, ARC CE, dCache ▪ 127, cloud@UNIGE ▪ 199, SWITCH BCC

No.	Name
F-CC-2	**On demand storage infrastructure (Infrastructure as a Service)**
	Description:
	▪ With a virtual storage infrastructure, memory space can be used on an ad hoc, flexible basis. ▪ Virtual memory can be configured by the user and provisioned by entering the necessary attributes. ▪ When the memory is no longer required, the resources are released.
	Main functionalities:
	▪ Portal for access to, and administration of, the storage infrastructure ▪ Access management/user administration ▪ Infrastructure maintenance ▪ Training in using the infrastructure
	Derived from the following use cases:
	▪ 005, 008, 042, 058, 072, 144, 186, 198

	Existing projects and services based on the use cases:
	▪ 005, CSCS, www.cscs.ch ▪ 008, ETH Storage Service by the IT Department, CSCS Remote Scalable NAS project ▪ 198, SWITCH BCC (Building Cloud Competence)

No.	Name
F-CC-3	**Interface to HPC resources (high performance computing)**
	Description:
	Provision of interfaces with high performance computing resources.
	Main functionalities:
	▪ Portal to high performance computing resources (without setting up your own high performance computing hardware)
	Derived from the following use cases:
	▪ 017, 021, 043, 128
	Existing projects and services based on the use cases
	▪ 017, VM-MAD ▪ 021, Swiss WLCG, CREAM CE, ARC CE

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UFG	SR 414.20 Bundesgesetz vom 8.10.1999 über die Förderung der Universitäten und über die Zusammenarbeit im Hochschulbereich	Die Bundesversammlung der Schweizerischen Eidgenossenschaft	http://www.admin.ch/opc/de/classified-compilation/19995354/201301010000/414.20.pdf	24. Juli 2013
UFV	SR 414.201 Verordnung vom 13.03.2000 zum Universitätsförderungsgesetz	Der Schweizerische Bundesrat	http://www.admin.ch/opc/de/classified-compilation/20000392/201301010000/414.201.pdf	24. Juli 2013
URG	SR 231.1 Bundesgesetz vom 9.10.1992 über das Urheberrecht und verwandte Schutzrechte	Die Bundesversammlung der Schweizerischen Eidgenossenschaft	http://www.admin.ch/opc/de/classified-compilation/19920251/201101010000/231.1.pdf	24. Juli 2013
VDSG	SR 235.11 Verordnung vom 14.6.1993 zum Bundesgesetzt über den Datenschutz	Der Schweizerische Bundesrat	http://www.admin.ch/opc/de/classified-compilation/19930159/201210160000/235.11.pdf	24. Juli 2013

Markierung	Titel, Beschreibung	Autor	Webadresse	Letzter Abruf
ZertES	SR 943.03 Bundesgesetz vom 19.12.2003 über Zertifizierungsdienste im Bereich der elektronischen Signatur	Die Bundesversammlung der Schweizerischen Eidgenossenschaft	http://www.admin.ch/opc/de/classified-compilation/20011277/200808010000/943.03.pdf	24. Juli 2013

Table 12: Bibliography

Annex F Glossary and list of abbreviations

Abkürzung / Begriff	Bezeichnung	Erläuterung / Webadresse
BFI	Botschaft über die Förderung von Bildung, Forschung und Innovation in den Jahren 2013–2016	[BFI]
BGA	Bundesgesetz über die Archivierung	[BGA]
BGÖ	Bundesgesetz über das Öffentlichkeitsprinzip der Verwaltung	[BGÖ]
BGV	Verordnung zum Bundesgesetz über die Archivierung	[BGV]
BInfV	Verordnung über die Informatik und Telekommunikation in der Bundesverwaltung	[BInfV]
CRUS	Rektorenkonferenz der Schweizer Universitäten	[CRUS]
DSG	Bundesgesetz über den Dateschutz	[DSG]
Eduhub	Eduhub ist ein Forum für neue Lerntechnologien an Schweizer Hochschulen	https://www.eduhub.ch
e-sic	e-science	
EIDI-V	Verordnung des EFD über elektronisch übermittelte Daten und Informationen	[EIDI-V]
EPFL	Ecoles Polytechniques Fédérales Lausanne	http://www.epfl.ch
ETH	Eidgenössische Technische Hochschule Zürich	http://www.ethz.ch
ETHG	Bundesgesetz über die Eidgenössischen Technischen Hochschulen. (ETH-Gesetz)	[ETHG]
ETWG	Educational Technology Working Group (ETWG)	https://www.eduhub.ch/community/etwg-educational-technology-working-group/
ESFRI	European Strategy Forum on Research Infrastructures	http://ec.europa.eu/research/infrastructures/index_en.cfm?pg=esfri
FH	Fachhochschule	
FHSG	Bundesgesetz über die Fachhochschulen (Fachhochschulgesetz)	[FHSG]
FIFG	Bundesgesetz über die Förderung der Forschung und der Innovation	[FIFG]
GeBüV	Verordnung über die Führung und Aufbewahrung der Geschäftsbücher. (Geschäftsbücherverordnung)	[GeBüV]
GEVER	Geschäftsverwaltung	

Abkürzung / Begriff	Bezeichnung	Erläuterung / Webadresse
HFKG	Bundesgesetz über die Förderung der Hochschulen und die Koordination im schweizerischen Hochschulbereich (Hochschulförderungs- und -koordinationsgesetz)	[HFKG]
IDHEAP	Hochschulinstitut für öffentliche Verwaltung	http://www.idheap.ch
ISchV	Informationsschutzverordnung	[ISchV]
IUKB	Institut Universitaire Kurt Bosch	http://www.iukb.ch
JISC	Joint Information Systems Committee	http://www.jisc.ac.uk
LA	Lenkungsausschuss	
MwStG	Bundesgesetz über die Mehrwertsteuer	[MwStG]
MwStV	Mehrwertsteuerverordnung	[MwStV]
OA	Open Access	
OAIS	Open Archival Information System	[OAIS]
OLA	Operation Level Agreement	
OR	Obligationenrecht	
RACI	Responsible, Accountable, Consultet, Informed	[RACI]
RVOG	Regierungs- und Verwaltungsorganisationsgesetz	[RVOG]
RVOV	Regierungs- und Verwaltungsorganisationsverordnung	[RVOV]
UFG	Bundesgesetz über die Förderung der Universitäten und über die Zusammenarbeit im Hochschulbereich (Universitätsförderungsgesetz)	[UFG]
UFV	Verordnung zum Universitätsförderungsgesetz	[UFV]
URG	Bundesgesetz über das Urheberrecht und verwandte Schutzrechte (Urheberrechtsgesetz)	[URG]
SLA	Service Level Agreement	
SUK	Schweizerische Universitätskonferenz	http://www.cus.ch
SURF	SURF ist die gemeinsame Organisationseinheit des Hochschulwesens und der Forschung für ICT in Holland.	http://www.surf.nl
XSEDE	Extreme Science and Engineering Discovery Environment	https://www.xsede.org

Table 13: Glossary & list of abbreviations