Translation (the French text shall be considered as being the definitive version)

Contributions related to projects 2013-2016

Request for a SUC program

N.B. For reasons of clarity, only the masculine form is used throughout this document when it is not possible to use a neutral expression; the masculine form therefore refers to both sexes. In addition, for the purposes of this translation, the term Swiss University Conference (SUC) has been used throughout.

Program title:
Scientific information: access, processing and safeguarding

1. LAU (Law on Aid to Universities) federal funding 2013-2016 requested

CHF 37'000'000

2. Start and end of program financing

(starting at the earliest on 01.01.2013; ending no later than 31.12.2016)

Start of the program: 01.01.2013. End of the program: 31.12.2016

3. Head of the Program - contact for the SUC and SER (State Secretariat for Education and Research)

(1 person)

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First name	Martin
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4. Program Coordinator, if this is not the same person as the Head of the Program

(1 person, receives a copy of all correspondence)

Name	Werlen
First name	Raymond
Title	Dr, Assistant Secretary General
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The Program Coordinator's duties will be assumed by the Project Manager, who is currently in the process of being recruited. This role has been provisionally taken over by Dr Raymond Werlen, Assistant Secretary General of the CRUS.

5. Partners: Swiss higher education institutions, universities and others

a. Cantonal universities:

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

b. ETH institutions (Swiss Federal Institutes of Technology):

The 2 ETH and 4 research institutes.

c. Universities of applied sciences:

The 7 public universities of applied sciences. The KFH (Rector's Conference of the Swiss Universities of Applied Sciences) has been invited to participate in the program as part of the Steering Committee and Project Group.

d. Other institutions eligible for grants under the LAU:

The program is in principle open to those institutions that are eligible for grants according to the LAU (IHEID, IDHEAP, IUKB, FS Schweiz), either through their own funding or the provision of services.

e. Other:

Universities of teacher education:

Certain partners such as SWITCH, library networks, 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 theoretically open to other partners (e.g. institutions as per Art. 16, Federal Archives), either through their own funding or the provision of services.

6. Description of the program

6.1 Outline of the current context

Scientific information is a strategic issue which initiates investigation and reflection on an international scale. At a European level for example, the following can be cited: the report *Riding the* Wave - *How Europe Can Gain from the Rising Tide of Scientific Data*[1], in which a group of experts have examined the issues raised by scientific data, the European Commission's communication on ICT infrastructures for online science[2], or in a broader context, the Digital Strategy for Europe regarding which the EU initiated a consultation in July 2011[3]. At a national level, the following are worthy of note: *Gesamtkonzept für die Informationsinfrastruktur in Deutschland*, published in April 2011[4], the *Roadmap for the Utilization of Electronic Data in Research*[5], and also the report *The National Digital Library - Collaborating and Interoperating*[6], published this year by the Finnish Ministry of Education and Culture. More particularly, as far as European universities are concerned, also to be mentioned are *The LERU Roadmap Towards Open Access*[7] and *Keeping Research Data Safe: A Cost Model and Guidance for UK Universities*[8]. The international dimension of scientific information is especially important, given the global nature of science and its collaborations.

The evolution of information and communication technologies is transforming the world of research in a rapid, ongoing and sometimes unforeseeable manner. The computerization of research now has an impact on all scientific fields, not only the "hard-core sciences" but also the humanities or social sciences; and the major scientific discoveries and breakthroughs invariably require broad access to the most recent data and state-of-the-art technologies. As an invaluable adjunct to the traditional scientific methods based on experience and theory, recourse to powerful and innovative IT systems means that not only can researchers carry out simulations (3rd paradigm) but that they also have the possibility to explore large data sets (4th paradigm)[9].

Unlimited and widespread access on the part of the Swiss higher education institutions to internationally available sources of scientific information is vital to the competitiveness of research and science in Switzerland in all disciplines. At the same time, collaboration between researchers and between institutions is gaining increasing importance as far as scientific work is concerned. Researchers need access to data held by other institutions, access their own data from other sites, and also to exchange data through collaborations. This mobility of persons and data resulting from collaborative efforts requires the setting up of new services with the appropriate security and sharing safeguards that guarantee respect for the rights to data access and the use of common standards that ensure the secure exchange of information. Moreover, the information generated by scientific work is now almost exclusively produced and processed in electronic form (measuring instruments, data collection devices, databases, Internet, Cloud). And their volume is increasing exponentially in a large number of disciplines. Storing these data so that they remain accessible for as long as is necessary, whether for publication, for reasons of intellectual property, for their potential scientific reference value, or for future use, is also a major issue. It

[1] http://cordis.europa.eu/fp7/ict/e-infrastructure/docs/hlg-sdi-report.pdf
[2] http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0l08:FIN:FR:PDF
[3] Consultation on scientific information in the digital age: http://ec.europa.eu/research/consultations/scientific_information/consultation_en.htm
[4] http://www.leibniz-gemeinschaft.de/?nid=infrastr
[5] http://www.minedu.fi/OPM/Julkaisut/2011/Tiekartta_tutkimuksen_sahkoisten_tietoaineistojen_hyodyntamiseksi.html?lang=fi &extra_locale=en
[6] http://www.minedu.fi/export/sites/default/OPM/Julkaisut/2011/liitteet/OKM26.pdf?lang=en
[7] http://www.leru.org/files/publications/LERU_AP8_Open_Access.pdf
[8] http://www.jisc.ac.uk/media/documents/publications/keepingresearchdatasafe0408.pdf
[9] The Fourth Paradigm. Data-Intensive Scientific Discovery. Microsoft Research, T. Hey, S. Tansley and K. Tolle (eds) 2009: http://research.microsoft.com/en-us/collaboration/fourthparadigm/

is essential that researchers are able to store, exchange, and make available to others basic data and the results of their research in a safe, transparent and efficient manner.

6.2 Scenarios of the future

This program must meet the needs of the users and the institutions in terms of access and the management of scientific information in all its forms. Before examining the various fields of activity covered by this national program it may be useful, via various scenarios, to project the results expected from this program for different categories of beneficiaries.

6.2.1 Bill, a researcher in digital humanities

Bill is a researcher in the humanities who has begun to investigate a new research area. Initially, his work involves reviewing the recent publications in the field. And with the program launched by the SUC in 2013, the electronic content pertaining to a wide variety of research areas is easily and immediately available, including a highly specific area such as his through "pay-per-view" access. Bill is therefore able to access his demand for any literature he may need including some valuable, rare books which are available through the new portal, e-lib.ch, which he can integrate directly into his personal research environment.

Secondly, as he has no programming experience or access to substantial computerized resources in his own department, Bill then contacts his institution's IT service to implement the algorithmic processing of specific information contained in an extremely large body of publicly available data. He subsequently finds out that a set of new services for the processing and management of data has recently become available in the Swiss Academic Cloud thanks to the SUC program. Particular attention has been paid to the ergonomics of the web interfaces, so that researchers who are not necessarily familiar with these new technologies can use these services almost intuitively.

The resulting data, which are stored in the Cloud, are very promising. Bill then wants to give his students the possibility of experimenting with these algorithms on an ad hoc basis on other applications he has developed for use in his teaching. To this end, Bill creates a dedicated space for his students on the personal learning platform set up within the SUC program, which gives them access to the Cloud. At the end of the semester, given the successful experience of this teaching initiative, Bill decides to enter his teaching environment into a peer-approved open access (open educational resources, OER) database for teaching resources. Following the introduction of the SUC program, regularly organized good-practice seminars led him to discover the Merlot repository, which now allows him to offer other institutions and students the opportunity of putting his innovative algorithm into practice, and thus to generally improve upon learning in this scientific area.

6.2.2 Rosa, a researcher in environmental science

So far, to carry out her research, Rosa always had to book the required IT resources several months in advance. But with the SUC program, Rosa heard about some new services which had been developed. She was very intrigued by this program, and contacted her institution's IT department to find out how the system she was currently working with (which, it should be mentioned in passing, is extremely complex with several GPUs generating large amounts of data) could be installed. Rosa received a highly detailed leaflet explaining how to install her system in the Cloud, together with the name of an expert from an IT center who could assist her with this.

As all the Swiss higher education institutions' IT resources have been pooled through the new system set up within the framework of the SUC, the average waiting time to obtain the GPUs she needs is less than 2 days. Moreover, she has the opportunity to request different storage periods for data, although for periods of more than 10 years she will have to contribute financially (she has also received instructions

from the Swiss National Science Foundation [SNF] that 3% of the grant for her project must be allocated to the sharing of scientific data). If she opts for this service, her data will be stored in a "scientific object repository" (SOR) and they will be given a permanent identification (similar to a digital object identifier, DOI). She will also be able to give this ID to journal publishers each time her work has been accepted for print. Published together with the text in question, permanent IDs allow the scientific community to access the same data sets as those used by the authors to validate their models.
In this leaflet, Rosa also discovered the possibility to create spaces within a personal research environment also provided by the Cloud, to help keep the specific parameters (she can create as many spaces as she needs) and other spaces dedicated to the analysis of data with statistical tools and data visualization provided by her institution. Rosa was also happy to discover that she could access all these services using the same login she already uses for her e-mails.

6.2.3 Daniel, online teacher

Daniel is a teacher who provides online teaching. Students who are domiciled abroad, mostly in African countries, follow his courses from their respective homelands. Until now, Daniel has encountered problems in offering his African students access to publications. In fact, most of the time the virtual private network (VPN) connection hasn't worked, and during the workshops his students have had difficulty in accessing material under copyright. However, with the new SUC program, Daniel heard that a great deal of support has been given to open access, and that many researchers in his field now publish using the Golden Road.
In the personalized learning environment (PLE, developed within the SUC program), Daniel can specify all the necessary links he needs to improve his lessons, including recently published articles in open access journals. Moreover, in the PLE, there is a "Recommendation tool" that can automatically advise students on the educational resources available via open access (OER), that are related to his teaching field.
Furthermore, the PLE offers an e-portfolio tool where students can upload their current work and write their notes on what they have done. For Daniel, this is a very useful tool for following his students' progress. In principle, assessment remains the most problematical aspect because in theory the students have to travel to Switzerland to take their examinations. However, Daniel is going to test out the new e-assessment service, which is also provided and secured through the PLE. Although this system is very secure, Daniel still has to find a solution, with the aid of the embassies in question, to the problem of identifying those students who take the exam at a distance.

6.2.4 Alexis, a new student

Alexis has just started university. During his first lesson, he was pleased to learn that the e-portfolio he had begun at secondary school could be transferred to the so-called "PLE" environment of the Swiss higher education institutions. In addition, the first time he connected to this learning environment, a set of recommendations suggested some very relevant resources to him (he later learned that they were called "OER" because of their free access). The surprises did not stop there. During the second semester, a teacher invited his students to create a new learning space in which a simulation tool allowed them to play with a complex model of blood circulation. Alexis completed his training with other similar OER tools he had found by himself on the web, and several journal articles on the subject that he had been able to download on demand, apart from a few documents he was unable to access freely (oddly labeled as "pay-per-view"). Alexis intends to participate in the Erasmus program. He was therefore relieved to learn that all his PLE were accessible from no matter where, and that at the end of his studies he would even be able to keep his learning space for an indefinite period of time thanks to his permanent digital ID, also developed under the SUC program. With such a service, a long-lasting bond has been created between

Alexis and his university, and it would be no surprise if he became a fervent adept of ongoing training and an active alumnus.

6.2.5 Nadia, rector of a major university

Nadia is very intrigued by the SUC program which has now been running for two years, and so she has decided to find out more about it. Her attention has in particular been drawn to two subjects that have preoccupied her since she assumed her responsibility as Rector. The first of these concerns access to scientific literature. During the past 5 years the cost of licenses has become exorbitant, and Nadia fears the worst. She thus contacted the head of the library, who took no time in reassuring her. Based on sound statistical data, the Consortium of Swiss Academic Libraries has recently proposed two major efficiency measures within the framework of the SUC program. First of all, the Swiss higher education institutions should limit licenses to the most frequently consulted journals, and adopt a pay-per-view policy for the others.

Secondly, part of these savings could be invested to help develop the “Golden Road”, which implies that researchers would have to pay for publication, but that access would then be free of charge. This is a cost model that the institutions have had a problem in introducing due to the lack of funds to spend on switching from a licensing to an open access model. The SUC program will thus enable this transition to be made.

The second subject of concern to Nadia relates to the IT resources for the management of scientific data. Over the past years, she has seen the emergence of IT centers throughout Switzerland, and she is wondering about how researchers can derive the maximum benefit from them. Research groups tend to buy their own servers and disks for storing data, which she doesn’t find that efficient for a number of reasons. However, the head of IT was able to reassure her by explaining how, through the SUC program, an access service to the pooled high-performance computing (HPC) resources of the Swiss higher education institutions is now available for researchers, together with an expert service for optimizing the algorithms. She has also been reassured to learn that unique data can be stored in a secured infrastructure, the cost model of which has been thoroughly studied, thereby allowing a reliable multi-year budget forecast to be made. Nadia has also been informed that other subjects such as e-learning and the digital humanities can benefit directly from this SUC program and that, last but not least, both students and researchers can from now on have a permanent digital identity which they are able to keep even after they have left their institution. As far as the students are concerned, she feels that this could well create long-lasting relationships that will potentially encourage them to take on further studies at a later date in the ongoing education program at her institution, which is a source of much satisfaction to her.

6.3 Specific problems that the program intends to solve

In order to successfully deal with these scenarios of the future and many others, a set of specific problems must be solved.

In the e-publishing sector, the Consortium of Swiss Academic Libraries has already been acquiring electronic information (online journals, databases, e-books) for over ten years. E-lib.ch (the Swiss electronic library) provides a web portal for searching for scientific information including an extensive meta-catalog (Swissbib), and is progressively enlarging the range of information accessible via electronic means. In this particular context, the somewhat thorny questions are raised regarding data management and the long-term safeguarding and storage of scientific information.

In the fields of identity management, working environment, Cloud computing, and data management, SWITCH is involved in the development, as part of the AAI (national platform for authentication and authorization) and AAA (''E-infrastructure for e-science'') infrastructures and in partnership with specialists within the Swiss higher education institutions, of various tools for accessing, managing, processing and exchanging information, such as SWITCHconnect, SWITCHPoint, SWITCHcollection or projects related to lifelong e-identities, virtual organizations, grid middleware and e-learning. There are also other projects and organisms (e.g. as far as the Swiss Foundation for Research in Social Science [FORS] is concerned, the Academies, the Swiss National Supercomputing Center [CSCS], and SwiNG), which have been set up at the initiative of different scientific groups.

Moreover, as mandated by the SUC, the experience acquired within the framework of the Consortium of Swiss Academic Libraries and projects B-02 AAA / SWITCH and B-03 e-lib.ch should be fully taken into account and pursued in a joint program.

The above-mentioned activities are proof of the efforts made to promote the access of Swiss higher education institutes to scientific information and state-of-the-art services. However, it appears that due to the number of independent projects carried out in parallel by different entities, the Swiss higher education sector does not yet have a comprehensive strategy for its supply of information and services. The program aims to remedy this state of affairs by building on the aforementioned achievements. However, rather than just pursuing its activities, the program provides a transition towards a greater coherence based on an in-depth assessment and development of a national strategy focused on the needs of researchers, teachers and students alike. Then with the coordinated implementation thereof, ensured by bringing together the different skills and know-how involved, it aims to put in place services that meet the above-stated needs and which also take into account the differences between the various disciplines and institutions. This national strategy should be sufficiently flexible to take into account the unforeseen aspects relating to the developments in IT and communication technologies. It will be updated according to the evolution of these technologies, and will include mechanisms for project assessment, prioritization and optimization of costs. The program will also include an organization in charge of the coordinated development and implementation of the strategy. Further details on this organization have been presented in section 6.5. We are therefore moving towards the creation of a "Swiss Academic Cloud", focused on the needs of different categories of users and the pooling of resources, which includes fields as diverse as e-publishing (licenses for electronic media, digitized documents, open access), data management (data and metadata for research and teaching purposes, data lifecycle management, long-term archiving), identity management (long-term identity, personal data), Cloud computing (virtualization and pooling of resources, infrastructure as a service, software as a service) and e-learning (mobile platforms, personalized learning environment, e-portfolio, e-assessment, open educational resources).

These areas are all interrelated and complementary, albeit at different stages of development. They require the input of experts from different disciplines, who can contribute their specialized skills - whether from libraries, computer services, legal services or other areas of expertise. The efficient and effective implementation of the various areas on the one hand presupposes a high degree of decentralization in order to fully take into account the specific needs of the disciplines and institutions involved, but on the other hand a high degree of coordination or even centralization, in order to establish and encourage good practices, ensure interoperability (both at a national and international level), take advantage of potential synergies, and bring costs under control. It also requires the collaboration of different services, which are sometimes integrated within the Swiss higher education institutions, for instance IT services which may in fact be part of other entities, for example, certain cantonal libraries or entities that have already been organized at a national level, such as SWITCH, which provides a telematics service to the Swiss higher education institutions, the Consortium of Swiss Academic Libraries or the FORS competence center for social science[10].

6.4 Content of the program, innovative features, medium- and long-term objectives, products / concrete results aimed at, method used to achieve the objectives

The focus of this program is to provide, on a long-term basis, researchers, teachers and students of 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.

The program 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, respecting the legal constraints regarding the rights of access and data protection, while also taking into consideration the limited means available to the Swiss 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, and in making the best use of existing networks at national level. Other elements that are essential to the success of the program will be the setting up of specific cost-control mechanisms and ensuring appropriate financing.

To this end, the program includes the setting up and coordinated implementation of a national strategy for the development and sharing of the infrastructure, resources and services related to scientific information as defined by the Swiss Academic Cloud concept, under the strategic responsibility of the national organization described in section 6.5.

To determine the framework and direction of the activities to be carried out during the period 2013-2016 for setting up the Swiss Academic Cloud, the program is based on a generic model of the needs of the researcher, teacher and student as far as scientific information is concerned. According to this model, the scientist must:

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

[10] Swiss Foundation for Research in Social Science (http://www2.unil.ch/fors/)

Moreover, access to information and resources must remain possible regardless of location, particularly in the event of travel and / or collaborations.

This model of the needs of researchers, teachers and students leads to the definition of the seven following fields of activity as a departure point for the national strategy and the services to be developed during the period 2013-2016:

1. National organization (see below, section 6.5).
2. e-Publishing: licensing for electronic documents (current publications and "back-file archives"), digitization and presentation of historical documents, implementation of an open access policy.
3. Data management: management, provision and storage (long-term) of research data and educational material (metadata, life-cycle data, permanent archiving).
4. Identity management: setting up 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.).
5. Cloud computing: implementation of an 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 fields.
6. e-Learning: developing the infrastructure necessary for education based on electronic means, in particular mobile platforms, personal learning environments, e-portfolio, e-assessment and open educational resources.
7. Working environment: integration of different services in ergonomic and personalized virtual environments to support the work of researchers, teachers and students.

The estimated needs to achieve the aims envisaged for the period 2013-2016 in these fields of activity by far exceed the means available (see section 6.4.8). It will therefore be necessary to make choices, depending on the priorities to be determined by the strategic organs of the program. Moreover, although most of the activities to be undertaken are interdependent, their state of advancement varies widely, e.g. between the maintenance of current services and the de novo creation of new services. A great deal of strategic, hard thinking is therefore necessary to analyze the various requirements and their interdependencies, determine the objectives, identify potential synergies and make strategic choices.
To this end, the program foresees 2013 as a year of transition during which these fields of activity will be analyzed, reviewed, and subject to careful consideration as part of setting up the national strategy. During this year of transition and reorientation the activities developed during the previous period – thanks to the contributions related to projects – will be reduced to the minimum necessary for their maintenance and operation, with no development being envisaged before the validation of the national strategy. The decisions regarding the activities to be maintained in 2013 and their mode of financing (project-related contributions and own contributions) will be made in 2012 by the organs of the program. New developments will then be launched, in principle from 2014 onwards on the basis of the national strategy, set up in consultation with program partners under the responsibility of the Steering Committee and coordinated by the Project Group (see section 6.5). The implementation of the strategy will include a competitive process for the allocation of responsibilities and the selection of projects to attain the objectives of the period in question which are considered as having priority.

For the objectives set within the various fields of activity, the Project Group will be issuing a call for proposals, aimed at achieving the objectives set out in the national strategy. The call for proposals is

issued by decision of the Steering Committee. The calls for proposals are open to all project partners. The Project Group then evaluates the projects that have been submitted, if necessary with the assistance of external experts. Following this step, it submits the results of its evaluation and its recommendations to the Steering Committee, which decides which projects should be funded under the program.

The project organization then coordinates the work of the different players involved through the global management of the project, taking into consideration that an optimal equilibrium should be reached between the centralization of tasks for reasons of effectiveness and their decentralization for reasons of efficiency.

Special case: The SUC has decided that the projects "Kooperative Speicherbibliothek Schweiz" (centralized archiving of printed matter, thereby avoiding duplications) and "e-Codices'' (platform for the digitization of manuscripts), regarding which the estimates amounted to CHF 1.325 million and CHF 2.5 million respectively for the period 2013-2016, should be financed as part of this program. On November 11 2011, the CRUS recommended that the "e-Codices" project should be given first priority at CHF 2 million while it only placed the financing of the "Kooperative Speicherbibliothek Schweiz" project in third place. In order to respect the SUC's decision, the program foresees allocating a sum of CHF 3 million (80% of the amount requested), i.e. for financing the "Kooperative Speicherbibliothek Schweiz" at CHF 1 million and the ''e-Codices'' at CHF 2 million. These two projects will be expected to submit a detailed description and explanation that meets official requirements. They will be able to start up their respective activities in early 2013, following approval of their detailed projects by the Steering Committee, to which they will have to report annually. They will nevertheless be encouraged to collaborate with other similar activities developed under the program, and integrate within the national infrastructure which is to be put in place.

6.4.1 National organization

6.4.1.1 Expected benefits

The issues to be addressed by this program, its complexity and the large number of stakeholders involved, not to mention the expertise to be brought together in a joint effort require the strong and highly structured organization of this program. This organization will permit the groundwork to be laid for a coherent strategy, the transition to this new program and even beyond to be well managed, a management framework to be put in place to ensure that the different projects set up contribute towards this new national strategy and provide the results expected by the scientific community. This organization will also ensure that it makes full use of all possible synergies to avoid duplication, and will pay particular attention to cost control.

6.4.1.2 Goals / Description

The program provides for the setting up of an organization for the project, described in section 6.5.1 (Steering Committee, Project Group, Project Manager). In 2013, this organization is expected to develop the overall national strategy for the Swiss Academic Cloud in the form of a White Paper and ensure that the implementation thereof is fully controlled and coordinated during the period 2013-2016. It must ensure that the program is integrated at a national and international level, and prepare the way for a stable and financially viable structure beyond 2016. It must also ensure the dissemination and outreach of the program, so that what it can offer is made known to the scientific community.

6.4.1.3 Objectives to be achieved during the period 2013-2016
In addition to the tasks of ensuring the optimal running, coordination, project management and strategic control of the entire program, the latter includes the following objectives for the national organization:

- setting up the project organization described in section 6.5 for the fall of 2012, so that it becomes operational in January 2013;
- drafting a White Paper that lays the ground for an innovative and unifying concept which meets the needs of researchers from different scientific fields, inspired by best practices and based on cost-effective models. This document, which will be based on a sound understanding of the needs of researchers from the different scientific fields, will determine the objectives and modalities of implementing program activities for all its areas of activity. It will be adopted no later than the end of 2013, and then updated according to developments in the domain;
- the proposal of a stable structure that will permit the pursuit and development of the activities put in place through the program so that they can be viably financed from 2017 onwards. A preliminary outline of such a structure will be presented in the White Paper. A concrete proposal will then be submitted for adoption in the planning for the period 2017-2020.

6.4.1.4 Activities to start / structures to be supported from January 2013 onwards
The program plans to support the national organization from January 2013 onwards.

6.4.1.5 Financial data
The running of the national organization requires recurrent financing estimated at CHF 375,000 per year as part of project-related contributions during the period 2013-2016. From 2017 onwards, the financing thereof should again be taken up, as the above-described stable structure will by then have been put in place.

6.4.2 e-Publishing

6.4.2.1 Expected benefits
The problem of access to online publications is a nationwide issue. The setting up of a joint acquisition policy should eventually reduce costs for the institutions while simultaneously improving the offer to researchers. This national approach should, however, also apply to open access to publications. In fact, to the extent that the passage from a closed (paying for licenses to access the articles) to an open world (the institution pays when an article is published, but access then becomes free of charge) requires double taxation during the transitional phase, this creates a funding problem at institutional level that a national approach could relieve. This project therefore provides a double opportunity to streamline costs by offering the prospect of free access to publications, which will ultimately increase the intellectual value of the latter (return on investment). In parallel to this approach, it would also be beneficial to more clearly define the policy for the digitization of archives in order to determine strict criteria to avoid duplication or, conversely, to avoid the loss of some documents of national or scientific importance.

6.4.2.2 Goals / Description
The field of e-publishing involves the acquisition of licenses for electronic documents (current and so-called back-file archives), digitization and presentation of historical library collections and the development and implementation of the open access policy to ensure free access to scientific publications. In all domains, it is possible to build on pre-existing activities, some of which have been supported by the Federal Government.

6.4.2.3 Objectives to be achieved during the period 2013-2016
The objectives to be achieved in the e-publishing field of activity during the period 2013-2016 are focused on the acquisition of licenses (licensing), the digitization of content (digital content) and open access.

Licenses
The Consortium of Swiss Academic Libraries has been active in the acquisition of licenses since the year 2000. It supports all the Swiss higher education and research institutions in purchasing electronic scientific information resources. The project aims at ensuring the long-term supply of scientific information in the form of databases, online journals, e-books, etc. It includes two sub-projects: "Current licenses" and "National licenses". The main tasks of the Consortium consist of the acquisition of licenses, provision of technical access, processing of usage data and setting up of statistics, maintenance of the content acquired, and the follow-up of current developments with a view to an innovative development of the offer, with the support and advice of the Consortium partners.
The central management of licenses aims at reinforcing synergies. The negotiation of licenses requires considerable experience, in particular when dealing with international publishers. The cooperation of the libraries reinforces the position of the Consortium as negotiating partner. The necessary knowledge of legal issues can be centrally established. The collaboration with other Consortia in the world is made possible. No single library is capable of amassing the specialized knowledge necessary, neither from a financial point of view nor in terms of the members of staff required.

Digitization of content
The digitization of pertinent content in view of free online access and user-friendly presentation is one of the two focal points of the project for cooperation and innovation 2008-2011/2012 "e-lib.ch: Swiss electronic library". Following the setting up and development of digitization platforms, various historical library collections are now accessible in electronic form and may be consulted beyond institutional limits. This includes old editions, manuscripts from the Middle Ages, others from the beginning of the modern era, and scientific publications. At the same time, standards for the enhancement of digital objects have been developed and will be able to serve as a guideline for future projects.
From 2013 onwards, it will then be a question of extending the digitization projects to other types of content (Swiss printed matter of the 17th-19th centuries, other medieval manuscripts and manuscripts from the beginning of the modern era, graphics), and to thus reinforce the national and international presence as well as pursue the development of technological platforms, in line with the strategy of extension, change of system, optimization – in order to manage the rapidly increasing volume of data.

Open access
The open access movement aims at procuring open access to scientific knowledge. Thirteen scientific institutions in Switzerland have already signed the Berlin Declaration of 22 October 2003. They have thus undertaken to adopt measures to achieve the objectives of the open access movement. The installation of institutional servers (repositories) at several universities could serve as a starting point.
The Green Road to open access, that is to say, making publicly available pre-or postprints of unabridged scientific texts after a certain retention time determined by the publishers in question, has now become relatively commonplace. However, support for scientists in the publication of their research results in open access journals (the Golden Road) is still not systematically the case in Switzerland. Support activities of course exist in certain universities and Swiss higher education institutions in the form of projects. But as yet, no nationwide program has been set up. Therefore the situation in Switzerland is sometimes quite different from that observed in other countries. In order to support the Golden Road, a project must be launched that aims to encourage the publication of scientific articles in the major open access journals

through the financing of the corresponding publication fees, or participation in institutional initiatives such as the digital humanities may be required.
The strategy of the SUC program must be such that it guarantees a coordinated national approach in the domain of open access. Free access to research results constitutes a national challenge. This also includes free access to articles published in standard reviews, as described in the section on licenses.

6.4.2.4 Activities to start / structures to be supported from January 2013 onwards
In the e-publishing field of activity, the program plans to continue supporting the structures and basic activities of the Consortium of Swiss Academic Libraries and the e-lib.ch project, and thus enable a concept to be developed in 2013 as part of the national strategy. In 2013, in collaboration with the national organization, these bodies will draw up a plan for the implementation of complementary activities to be developed during the period in question. The actual activities will be launched in 2014 after the organs of the program have become fully operational.

6.4.2.5 Financial data
In 2011, the Consortium of Swiss Academic Libraries acquired licenses amounting to a total of CHF 19.8 million[11], including CHF 13.9 million for periodicals, CHF 5.3 million for databases and CHF 0.43 million for e-books. The schools of higher learning thus spent around CHF 19.2 million for the acquisition of electronic content through the Consortium, including CHF 13.4 million for the cantonal universities, CHF 4.9 million for the ETH institutions, CHF 0.9 million for the universities of applied sciences, and CHF 0.05 million for the universities of teacher education respectively. The remaining CHF 0.6 million were financed by the Consortium partners (the National Library and associate members). On average, each year the cost of licenses increases by about 5%. Management expenses (CHF 0.63 million, recurrent expenditure) are also financed by the partners in the form of a contribution per license acquired through the Consortium.
The program assumes that the institutions will continue to fund regular licenses included in the current offer, which represents a sum of around CHF 82.7 million for the period 2013-2016 (recurrent expenditure). This expenditure should be covered by the contributions from the Swiss higher education institutions, which the latter will continue to pay in the form of real money.
As part of the strategy, the contributions related to projects that will be focused on the acquisition of licenses will thus serve to finance national licenses (backfiles) and the corresponding management costs. The acquisition of national licenses for 10 to 12 products would cost around CHF 15 million (one-off expenditure) and CHF 0.6 million per year management costs (recurrent expenditure). CHF 2 million per year would then be needed from 2017 onwards to complete the range of national licenses according to the various needs. The definitive amount of the contributions related to projects that will be allocated to licenses shall be decided as part of the national strategy.

The expenditure agreed upon at national level for the digitization of content (and search portals) in 2011 amounted to CHF 8.3 million. This sum also included the running of the e-Codices project (around CHF 1 million). The remaining CHF 7.3 million were partially financed by contributions related to the e-lib.ch projects (CHF 2 million) and by own contributions from the Swiss higher education institutions (CHF 5.3 million). The maintenance and upkeep of ongoing projects (in particular the search portals e-lib.ch and swissbib.ch, also the digitized content of e-rara.ch or retro.seals.ch, but excluding e-codices) during the period 2013-2016 will require recurrent expenditure amounting to CHF 18 million. The distribution of funding in 2013 (CHF 4.5 million) between contributions related to projects and own contributions will be

[11] This represents only a part of the means allocated by the libraries to electronic content. According to … [sentence incomplete]

decided upon in 2012. The definitive amount of contributions related to projects that will be allocated to the digitization of content (and to search portals) shall be decided as part of the national strategy.

The support given to open access is not currently a subject of expenditure at a national level. The support given to the Green Road is currently assumed by the institutions. The recurrent expenditure necessary to provide support to researchers for publication costs under the Golden Road and accompanying measures is estimated at CHF 3.2 million for the period 2013-2016. The definitive amount of contributions related to projects that will be allocated to supporting open access shall be decided as part of the national strategy.

6.4.3 Data management

6.4.3.1 Expected benefits

Research generates a volume of data that increases exponentially over the years. The production and / or the acquisition of these data implies a certain cost, not to mention their analysis. As a result, it therefore becomes common practice, encouraged by sponsors and by the publishers of scientific journals, to allow the scientific community access to data (raw or pre-processed) so that it can reuse these data stored in scientific object repositories (SOR) without having to regenerate them.

In addition to transparency (verification of results), this leaves room for potential new discoveries. On the other hand, as far as the observation of natural events is concerned, data retention over the long term represents a precious heritage which society has the responsibility of passing on to future generations. Apart from the technical aspects, this program also focuses on making researchers aware of this practice of sharing "(guidelines"), which should be integrated at an early stage into a scientific project to identify data that need to be stored over the long term under standard formats which allow the reading and comprehension of this information over a long period. This clarification of the way in which data is to be managed will permit institutions to better predict the storage volumes, and thus to refine the cost models for long-term storage.

6.4.3.2 Goals / Description

So that researchers, teachers and students can store, process, exchange and access information and data relating to their scientific activity in a user-friendly, efficient and sustainable manner, it is necessary to put in place an appropriate data management system. This includes managing and ensuring the availability and storage (data curation) of research and education data through systems that are integrated into the processes of research, teaching and learning, as well as long-term archiving and data life cycle management, that is to say the ongoing assessment of the value of the data to be archived or eliminated.

This presupposes the putting into effect of electronic data management techniques based on internationally recognized best professional practices, so that the different scientific communities can be assured that their data are managed in a reliable manner and that, in the long term, they or other communities can access them at any time and from no matter where. A major challenge will be to address the problem of the explosion in data volumes produced by research in an increasing number of disciplines. Furthermore, in general, access to online publications is only guaranteed for a limited period of time. To enable researchers, teachers and students to have ongoing access to these publications, it is important to ensure the permanent archiving of data generated or acquired by university libraries (journals, monographs, non-textual data, databases, university in-house communications, collections, etc.).

6.4.3.3 Objectives to be achieved during the period 2013-2016
In this regard, the program includes the development of a scientific object repositories (SOR) concept. Its implementation will be subject to a call for proposals based on the concept that the national organization will develop in 2013 as part of the White Paper.
This initiative is aimed at ensuring the efficient management of digital data together with accompanying mechanisms for storage, sharing, secured access, cataloging, annotation, as well as long-term archiving, according to practices that correspond to established international standards. The SOR concept is based on a distributed architecture that enables efforts and knowledge to be shared and capitalized on. It must also allow for the enhancement of data beyond those originally generated by the researchers, through tools such as data mining, data visualization, mashup, etc., the beneficiaries of which will be other communities with research and teaching activities, and also society at large. Another important aspect to be taken into account in this context is the need for instruments (e.g. the Laboratory Information Management System [LIMS] in the areas of the exact and the natural sciences) which can provide researchers with real added value, so that the processing and safeguarding of information is not perceived as a constraint or as an additional burden.
The SOR should also allow the permanent archiving of data that have been acquired or produced by university libraries in order to ensure long-term availability and access to data, taking into account the preliminary work carried out in the e-archiving and e-lib.ch projects.

6.4.3.4 Activities to start / structures to be supported from January 2013 onwards
In the field of data management activity, in 2013 the program plans to start by developing concepts for the SOR and for the permanent archiving of data. Actual activities will be launched in 2014 following a call for proposals.

6.4.3.5 Financial data
The expenditure (one-off) necessary for setting up the SORs is estimated at CHF 12 million. The recurrent expenditure that will be required from 2017 onwards for the running and maintenance of these infrastructures is estimated at CHF 3 million per year. The expenditure (one-off) necessary for the establishment of a data life cycle management system is estimated at CHF 8 million. The recurrent expenditure that will be required for the running and maintenance of the system is estimated at CHF 2 million per year. The definitive amount of contributions related to projects that will be allocated to data management and data life cycle management shall be decided as part of the national strategy.

6.4.4 Identity management

6.4.4.1 Expected benefits
Digital identity is increasingly becoming a part of everyday activities, particularly in the academic environment. It is now commonplace for persons to have dozens of logins to access their workspaces. The cancellation of a contract at a Swiss higher education institution makes this problem even more acute. Therefore, the establishment of a permanent identity will ensure better continuity of the activities of the members of the Swiss academic community, both at a national level and beyond. Moreover, for the students who complete their studies and enter the professional world, the possibility of keeping, for example in an e-portfolio, track of all their previous academic activities (half-year papers, administrative data, personal notes, etc.) constitutes a major asset in today's society, in which ongoing learning throughout a person's lifetime is becoming the norm. This digital identity will also permit a link to be maintained with the institutions in which the student has received his education. In terms of administrative management, this digital memory will simplify the registration process, and therefore help to lower costs. Moreover, the question of diploma fraud could also be resolved by the introduction of this digital identity.

6.4.4.2 Goals / Description

The academic community (researchers, teachers and students) has access to the services of information and communication technologies that traverses the boundaries between organizations and countries. This requires the strong coordination of electronic identities through specific identity management mechanisms. However, the duration of a user login is currently limited and contractually bound to an institution.

In the future, identity management aims to create, at national level, a unique and permanent identity (for their entire lifetime) for each user. This identity should also include study documents and scientific curricula. These technologies will of course continue to involve students throughout their lifetimes, not to mention the alumni, whose markets are becoming increasingly important to the Swiss higher education institutions.

International compatibility represents an additional constraint that the identity management infrastructure must deal with in order to best serve the academic institutions. In addition, identity management will be based on the IAA infrastructure established by SWITCH in collaboration with the Swiss higher education institutions and which currently covers 98% of researchers, teachers and students of the latter institutions.

The above-mentioned features will enable identity management to ensure that personal data (certificates, diplomas, credits, e-portfolio, research results, etc.) remain uniquely accessible to the user in question via a ‘‘single sign-on’’ mechanism that is available from anywhere and for the user’s entire lifetime.

6.4.4.3 Objectives to be achieved during the period 2013-2016

In the identity management field of activity, the program provides for the development of a concept in close collaboration with the Swiss higher education institutions and SWITCH. The implementation of this concept should take place via a call for proposals procedure, based on the structures already put in place in the SWITCH / AAI and SWITCH / AAA projects.

It is planned to extend the AAI platform and its mechanisms in order to best manage access according to user profiles over the long term (lifeIong identity management), and also to measure **/** invoice the use of resources. User identity will established on the basis of administrative data managed by the institutions and may be personally enriched by e-portfolios throughout the user’s lifetime. To meet the significant increase in the various needs in the different scientific fields, this distributed infrastructure must also extend its services in order to facilitate access to high-performance computing and storage resources, according to established international standards and also those to come in the field of Cloud computing.

6.4.4.4 Activities to start / structures to be supported from January 2013 onwards

In this field of activity, the program plans to continue supporting the SWITCH / AAA project structures focused on identity management and to thereby allow the development of a concept in 2013 in collaboration with the national organization. The actual activities will be launched in 2014 following endorsement by the organs of the program.

6.4.4.5 Financial data

The (one-off) expenditure necessary for setting up an identity management system based on the national AAI infrastructure is estimated at CHF 2 million. The recurrent expenditure that will be needed from 2017 onwards for the running and maintenance of the system is estimated at CHF 500,000 per year. The definitive amount of the contribution related to projects that will be allocated to identity management shall be decided as part of the national strategy.

6.4.5 Cloud computing

6.4.5.1 Expected benefits

The use of commercial Cloud services is not necessarily compatible with the requirements of the Swiss higher education institutions insofar as the rates, calculated on the basis of the architecture used, the number of processors, the amount of data stored and the transfer of these data are not that advantageous for specific and often demanding academic needs. Moreover, certain laws impose severe restrictions regarding the actual place where the data should be located, which sometimes makes it impossible to use servers outside of Switzerland. For these reasons, the development of Swiss know-how relating to the setting up and implementation of Clouds is absolutely necessary. Some Swiss higher education institutions which already possess their own IT infrastructures will be able to upgrade their Cloud services and thus offer the latter to researchers. Other institutions, which lack such infrastructures, should at least be able to have the possibility of using the remote services (i.e. IT as a Service, ITaaS) provided by a Swiss organism, in order to remain competitive in the use of high-performance computing means. Lastly, the grid networks, which are currently confronted with the problem of the availability of equipment due to energy-saving measures, could find an appropriate solution in the use of these Clouds, the design of which is in keeping with the best practices of "green energy".

6.4.5.2 Goals / Description

Researchers, teachers and students need access to the electronic resources required for their work without having to worry about the place or the equipment where the resources are located. This transparency can be achieved through the setting up of an "Academic Cloud" at national level. This involves a system which provides, in the form of services, access to and sharing of IT resources, in particular storage and computing capacity. Researchers will then be able to access storage capacity, computing capacity or other IT resources, no matter whether these are made available to them by their institution, by another Swiss higher education institution, or by a centralized service.

The location within Switzerland of storage capacity is mandatory, in order to meet legal requirements in the case of sensitive data, or to ensure the sustainability of service when the nature of the data so requires.

This system also allows Swiss higher education institutions to share IT resources between themselves or to obtain them from external suppliers without this causing any complications for the users.

6.4.5.3 Objectives to be achieved during the period 2013-2016

In the Cloud computing field of activity, the program includes the development and implementation of an "Academic Cloud" concept at national level, in close collaboration with SWITCH, the Swiss higher education institutions and an association known as the Swiss National Grid Initiative (SwiNG).

The aim is to develop and implement new virtualization and resource allocation models that will be able to rapidly and efficiently satisfy the increasingly demanding needs within the research field. These models will also have to include adequate mechanisms for invoicing costs so that the evolution of the demand can be efficiently managed.

To facilitate national and international collaborations while simultaneously optimizing the investments previously agreed upon at different levels, this Cloud concept will have to be developed according to a federalist principle and thus provide the scientific communities with the services they require to fully support the evolution of research. Its realization has now been made possible thanks to the national AAI platform that will have to be extended to allow users a simple and flexible access to these services (i.e. ITaaS) and measure **/** invoice their usage. The realization of the above-mentioned initiative can be based on the preliminary work carried out under the SWITCH / AAA project (in particular the Swiss Multi-Science Computing Grid, SMSCG), and also the European Grid Infrastructure (EGI) project.
The concept should take into account the quality of service in terms of accessibility, sustainability, security, etc., required by the different scientific communities, for which commercial offers of service are not always relevant. It is particularly essential to have a Cloud infrastructure that is based in Switzerland and managed by a Swiss company to ensure data confidentiality under Swiss law.
The implementation thereof should take place through a process of calls for proposals, based on the structures set up under the SWITCH / AAA project.

6.4.5.4 Activities to start / structures to be supported from January 2013 onwards
In the Cloud computing field of activity, it is planned to start the program in 2013 by developing a concept of "Academic Cloud" at national level. The actual activities will be launched in 2014 following a call for proposals.

6.4.5.5 Financial data
The expenditure (one-off) necessary for setting up a Cloud computing infrastructure is estimated at CHF 12 million. The recurrent expenditure that will be required from 2017 onwards for the running and maintenance of this infrastructure is estimated at CHF 3 million per year. The definitive amount of contributions related to projects that will be allocated to the Cloud computing infrastructure shall be decided as part of the national strategy.

6.4.6 E-Learning

6.4.6.1 Expected benefits
The development of research infrastructures (data management, Cloud computing, e-publishing, identity management, etc.) offers new learning possibilities. For example, access to scientific data, to simulation environments as well as to online publications all contributes to the development of knowledge. To achieve this, however, appropriate student-focused environments (personal learning environment, PLE; e-portfolio, etc.) are necessary so that information can be organized and structured in such a form as to meet the requirements of education. Moreover, today the potential of so-called ‘‘open’’ educational resources (OER) has not been sufficiently acknowledged or appreciated. This is due to a lack of awareness of these resources (on the part of the teachers), and also to the way in which they have been inadequately structured for the student. Thus, student-focused environments will permit, for example through the social networks, increased general awareness of these resources. This refocusing of learning will also require adaptation on the part of the teachers who will progressively become obliged to assume the role of "coach". Another aspect is that the evaluation of knowledge has also become a major issue since the Bologna process: teachers are now expected to regularly assess their students’ educational progress. This increasing workload can, however, be reduced through e-assessment, which clarifies the definition of standards and legal issues related to the evaluation process. These paradigm shifts in education will mean that the institutions concerned will have to make an innovative educational effort that the CCSP centers, which were set up during the 2nd phase of the Virtual Campus project, are capable of

assuming, in particular through the extremely dynamic Swiss network for the exchange of practices, eduhub.ch.

6.4.6.2 Goals / Description
Scientific information is primarily related to research activities, whether as a product or as an object. But education also needs scientific information in different forms, and makes use of platforms and services dedicated to learning. The program thus also plans to take into account the needs related to e-learning.

6.4.6.3 Objectives to be achieved during the period 2013-2016
For the e-learning field of activity, in close collaboration with the community, particularly the Educational Technology Working Group (ETWG), the program plans to develop and implement a concept for the coordinated setting up of infrastructures and services designed to meet the needs of the Swiss higher education institutions in the e-learning sector. The implementation thereof should take place through a process of calls for proposals, based on the structures already set up under the SWITCH / AAA project.

This initiative is especially focused on developing mobile platforms (online access to educational and informational resources via mobile devices, content tailored to this form of distribution), PLEs (which bridge the gap between the formal and informal), e-portfolios (for the "electronic" follow-up of the formal and informal skills and know-how acquired during basic studies and afterwards [lifelong learning]). The infrastructure should also be capable of supporting e-assessment (including the tools to be developed, which could reduce the burden that the assessment of skills and know-how represents for the teachers) and promote open educational resources (OERs; teaching and learning content in a freely accessible digital form).

6.4.6.4 Activities to start / structures to be supported from January 2013 onwards
In this field of activity, the program plans to continue supporting the SWITCH / AAA project structures focused on e-learning so that in 2013 a concept can be developed for the coordinated setting up and implementation of infrastructures and services that meet the needs of the universities in the e-learning sector. Actual activities will be launched in 2014 following a call for proposals, after endorsement by the organs of the program.

6.4.6.5 Financial data
The expenditure (one-off) necessary for setting up the infrastructures and services to meet the needs of the Swiss higher education institutions as far as e-learning is concerned is estimated at CHF 10 million. The recurrent expenditure that will be needed from 2017 onwards for the running and maintenance of the system is estimated at CHF 2.5 million per year. The definitive amount of contributions related to projects that will be allocated to infrastructures and services shall be decided as part of the national strategy.

6.4.7 Working environment

6.4.7.1 Expected benefits
The multitude of digital environments and associated tools as well as the diversity of information available impose a certain cognitive load on the users. Because of this, specifically adapted work environments must be designed in which the users can build up what they need. These building blocks, also known under the acronyms "PRE" for personal research environments and "PLE" for personal learning environments will be able to relieve some of the burden that users encounter in their everyday tasks, not only regarding the search for / discovery of information, the exchange of information between researchers, but also as regards scientific data management (storage, processing, sharing, etc.). As far

as the institutions are concerned, these environments will help to bridge the gap between the formal tools (those provided by the institution) and the informal tools that researchers, teachers and students frequently use, but which are sources of concern to IT centers from a security standpoint. This constitutes a "win-win" approach, in which the user considers that the institution best responds to his needs, while the institution gains greater control over the interaction between the web tools and its own infrastructures.

6.4.7.2 Goals / Description

The creation of personalized virtual environments to meet the needs of researchers, teachers and students and enable them to sustainably find, process, manage, view, distribute, share, reuse and store the scientific information and data they need in all their forms and in an ergonomic manner represents the ultimate goal of this program. It is in other fields of activity of this program that innovative services will be developed and integrated into these environments (PRE and PLE), providing support for the work processes of the researcher, teacher and student alike.

This objective can be based on the work that has already been carried out through e-lib.ch, in particular the web portals e-lib.ch and swissbib.ch, the entry points of the Swiss electronic library, which provide a single point of access that allows a simultaneous search within all the relevant data sources. It offers a multidisciplinary main access to the information landscape of Switzerland as well as to the offers and services for all subprojects. Amongst these there are also portals which permit access to the contents of individual sectors. They offer specialized search options, forums for scientific exchange, link collections and information services.

This objective will also be able to build on the work already carried out in partnership with the universities and made available to the scientific community as part of the SWITCH-AAA program (e-infrastructure for e-science), more particularly as regards the support given to virtual organizations, grid middleware and e-learning.

6.4.7.3 Objectives to be achieved during the period 2013-2016

In the working environment field of activity, the program plans to develop a concept of virtual environments customized to the needs of researchers, teachers and students. The implementation of this concept will build on certain tools and services developed under the e-lib.ch and SWITCH / AAA projects to attain the objectives to be defined in the context of this concept, which will integrate in an optimal manner the achievements made in the program’s other fields of activity. These work environments must obviously take into account the specific needs of the different disciplines and provide access to information and services that are available at an international level.

6.4.7.4 Activities to start / structures to be supported from January 2013 onwards

In the field of activity involving the working environment, in 2013 the program includes the development of a concept of personalized virtual environments that will permit researchers, teachers and students to use in a sustainable manner the scientific information and data they need in all their forms, and in a user-friendly manner. The actual activities will, at least initially, be integrated within other fields of activity.

6.4.7.5 Financial data
The financial means necessary for the development of working environments have already been included in the other fields of activity of the program.

6.4.8 Financial data: overview

Field of activity	**Current expenditure** (2011, national level)	**Means necessary** (estimate for 2013-2016)	**Provisional distribution** (linear reduction as per contributions related to available projects)	**Structural costs** (per year, from 2017 onwards)
National organization	-	1'500	1'500	375
e-Publishing				
Current licenses (own contributions)	19'200	82'754	82'754	25'000
National licenses (backfiles)	0	15'000	8'300	2'000
Administration	630	4'440	2'400	1'200
Digitization of content (and portals, contributions related to projects)	2'000	9'000	4'900	3'000
Digitization of content (and portals, own contributions)	5'300	9'000	9'000	
Open access	-	3'200	1'700	1'200
Data management				
Scientific object repositories	-	12'000	6'600	3'000
Data life cycle management		8'000	4'400	2'000
Identity management	-	2'000	1'100	500
Cloud computing	-	12'000	6'600	3'00
e-Learning	n/a.	10'000	5'500	2'500
e-Codices	1'000[1]	2'000	2'000	-
Storage library		1'000	1'000	-
Working environment	Included in other fields of activities			
Total	**28'130**	**171'854**	**127'754**	**29'075**

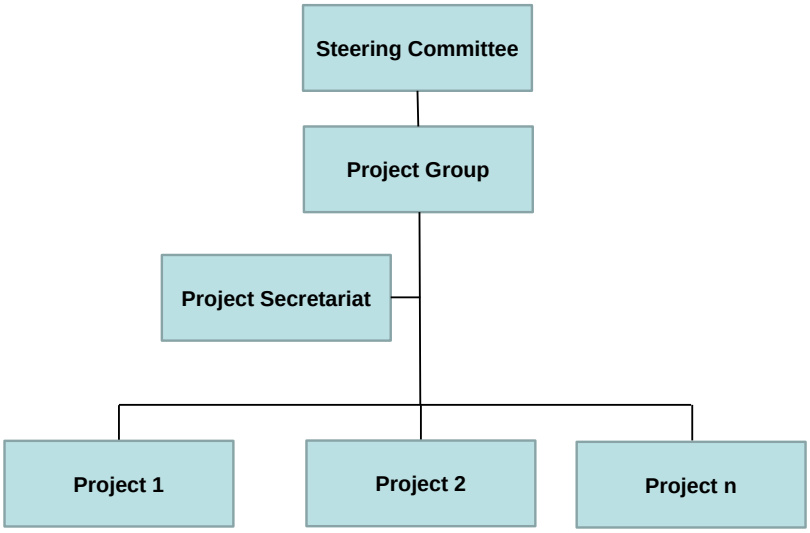
[1] Of which CHF 96,000 contributions related to projects, CHF 97,000 own contributions and CHF 814, 000 third-party means

The above table summarizes the financial data presented in the previous sections. It highlights the various requirements exceeding CHF 170 million for the period 2013-2016. The means available are, however, limited to CHF 137.7 million, the breakdown of which is as follows: CHF 91.7 million consist of own contributions from the universities and CHF 46 million contributions related to projects (see section 11). In particular, the table shows a provisional distribution between the various fields of activity, based on a linear reduction of the estimated needs. The project organization will be responsible for determining the definitive distribution of contributions as part of the national strategy and the implementation thereof.

6.5 Organization: structure, mode of collaboration and management framework

6.5.1 Structure

As far as the entire program is concerned, strategic responsibility is assumed by a Steering Committee, and operational responsibility by a Project Group presided over by a Project Manager. The various activities and projects coordinated under the program have their respective project organizations. The organization of the project set up within the program thus corresponds to the flow chart shown below.



6.5.1.1 Steering Committee

The management of the program is assured by a Steering Committee presided over by a Delegate from the CRUS regarding the issues of infrastructures for scientific information, Prof. Dr Martin Täuber, Rector of the University of Bern.

It also includes:

- Three management-level representatives from the universities, Prof. Dr Alex Eberle, Vice-Rector of the University of Basel, Prof. Dr Roman Boutellier, Vice-President of ETH Zurich and Mr Martin Kasser, Vice-President of Education of the HES-SO (University of Applied Sciences of Eastern Switzerland)
- One representative from the library sector, Prof. Dr Susanna Bliggenstorfer, Director of the Zurich Central Library and President of the CBU
- One representative from the field of computer science, Dr Alain Jacot-Descombes, Chief Information Officer (CIO) of the University of Geneva.

The Project Manager attends meetings of the Steering Committee in an advisory capacity.

The Steering Committee is elected by the CRUS by proposal of the Delegate in charge of the issues of infrastructures for the university representative and the ETH representative, by proposal of the KFH (Rectors' Conference of the Swiss Universities of Applied Sciences) for the representative of the Universities of Applied Sciences, by proposal of the University Libraries Conference for the representative in the library sector, and by proposal of ASIUS (Association of IT Services of Swiss Universities) for the representative in the field of computing.

The Steering Committee makes the strategic and financial decisions by proposal of the Project Group within the framework defined by the SUC and CRUS for the program. It reports directly to the CRUS.
It recruits the Project Manager.

6.5.1.2 Project Manager
The Project Manager is elected by the CRUS following a proposal made by the Steering Committee (which is responsible for recruiting him). He presides over the Project Group and directs the secretariat of the program. In agreement with the Project Group and the Steering Committee, he chooses the project management instruments which are suitable for the program.

6.5.1.3 Project Group
In addition to the Steering Committee, the organization of project set up within the program includes the Project Group, which is presided over by the Project Manager and also includes:

- managers of major projects
- leaders of the main fields of activity
- representatives of the users (scientific domains and types of Swiss higher education institutions)

The Project Group is elected by the CRUS following a proposal made by the Steering Committee. Its composition and organization may alter depending on the specific needs of the program. It develops the strategy, coordinates the activities and the projects, and ensures the strategic monitoring thereof. It reports to the Steering Committee.

Note on the secretariat:
The e-lib.ch project has an office which is responsible for the coordination of all the e-lib.ch projects since 2008 and is therefore familiar with a large part of the activities that the SUC program, "Scientific Information", has to coordinate. An integration of this office within the SUC program secretariat would allow a great deal of experience and knowledge to be maintained and should therefore be fully examined. Experience in the field of administration of federal projects and knowledge regarding the types of Swiss higher education institutions, including the universities, the ETH institutions and the universities of applied sciences should not be underestimated.
Similar skills and know-how can also be found at SWITCH, which has developed wide experience in the coordination and administration of national projects such as SWITCH / AAI and SWITCH / AAA, carried out in partnership with the universities and that provide services to the entire scientific community.
The organization of the program will take into account the expertise that is already available to ensure all or part of the secretariat of the program, while also optimizing its running and its cost-effectiveness.

6.5.2 Mode of collaboration
The Project Group maintains a strong national network for the exchange of technical information between experts from the individual fields of activity as well as contacts with key international partners. It maintains ongoing contact with partners who contribute independently to the realization of projects (e.g. the Consortium of Swiss Academic Libraries e-lib.ch, SWITCH, ETWG, SwiNG, FORS), thereby exerting an influence on managerial policy in the direction of the national strategy. It develops a financial plan for the Steering Committee for individual projects, and makes sure that their realization is coordinated and in conformity with the original plans. The operational mode reflects the principles of the network, i.e. non-invasive administration and subsidiarity as well as projects that can be qualified as multi-partner, multidisciplinary, integrated and complementary. The Steering Committee informs the CRUS and the SUC on a regular / annual basis on how the program is progressing.

6.5.3 Management framework

A project management framework must be established and implemented by the national organization in order to guarantee the soundness and good control of the investments that are to be made and to avoid distributing "blank checks" for the realization of such and such a project without being certain of its real interest to the Swiss higher education institutions or its proper management. In this respect, it is important to note that all projects will be submitted to scrutiny / structured assessment (expression of the requirements and the results to be attained, identification of beneficiaries, identification of partners, macro-planning, expected benefits / return on investment, integration within the Swiss higher education institutes' IT systems, complementarity with the other components of the program, etc.) with, should the outcome be successful, all these procedures taking place before the necessary funding has been obtained for their realization. Interim assessments should be regularly carried out to ensure the smooth running of the various projects, and if needs be, alter and redefine them.

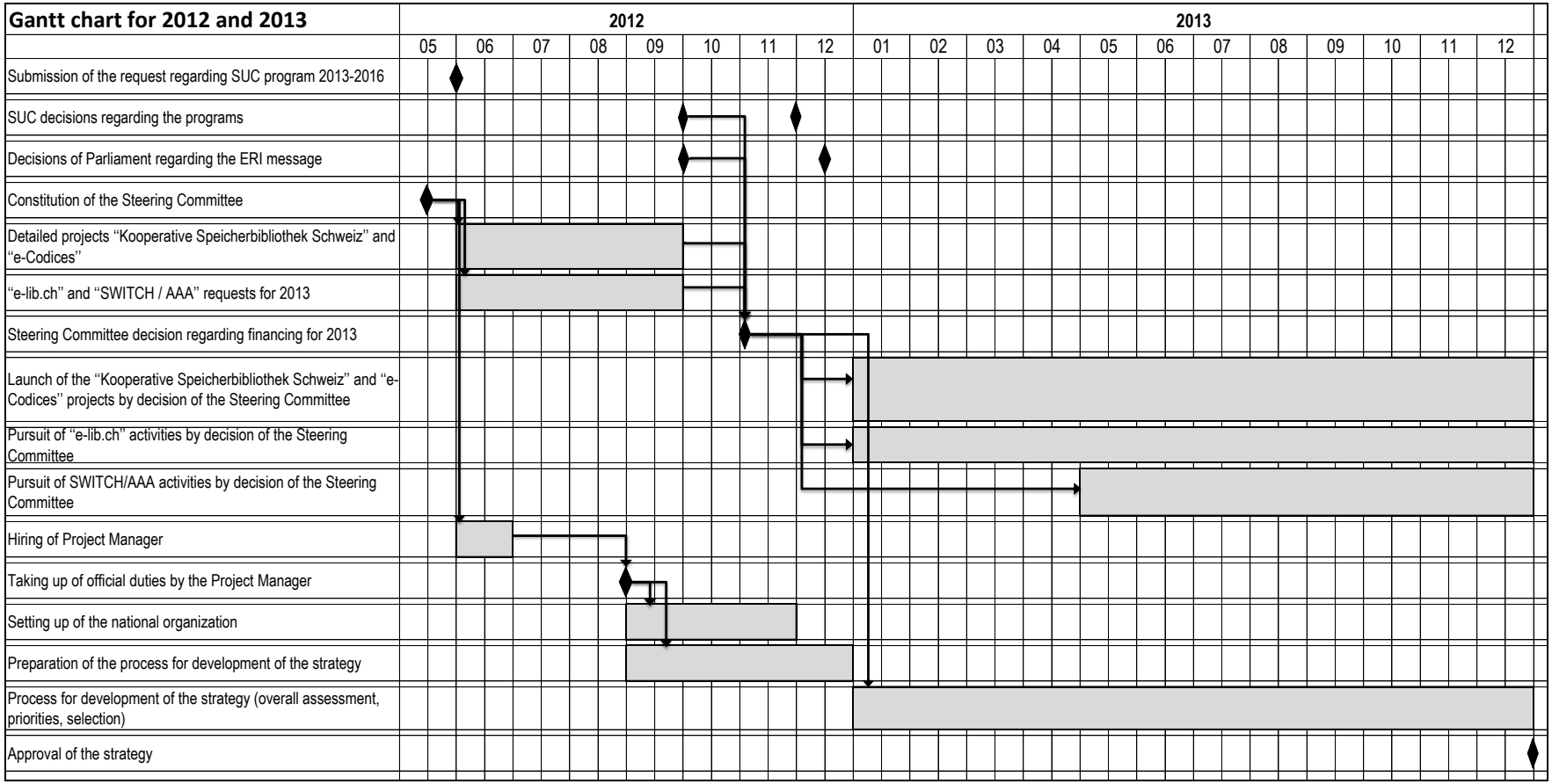
6.6 Consideration of the comments relating to the outline of the project and its evaluation

The comments relating to the outline of the project and its evaluation were taken into account throughout the drawing up of the text relating to the request. A reply to each of the comments made would be an extremely complex undertaking, and would not contribute towards the coherence of the request.

7. Schedule with landmarks and follow-up envisaged for the development of the project after 2016

(End of the program, resumption of its financing by the universities, other sources of financing, another demand for project-related contributions?)

2012	
16 May	Constitution of the Steering Committee
31 May	Submission of the definitive request for the SUC program 2013-2016 Invitation for a detailed project to be submitted on the part of the persons in charge of "Kooperative Speicherbibliothek Schweiz" and "e-Codices" Invitation for the submission by the e-lib.ch and SWITCH / AAA projects of a grant request in 2013
June	Hiring of the Project Manager
September	Taking up of official duties by the Project Manager Setting up of the national organization Preparation of the process for developing the strategy Submission of grant requests for 2013
Sept. / Dec.	Decisions on the part of the SUC regarding the programs, and of the Parliament regarding the ERI message
October	Decision by the Steering Committee on the 2013 financing of the projects "Kooperative Speicherbibliothek Schweiz", "e-Codices", e-lib.ch and SWITCH / AAA
2013-2016	
01.01.2013	Launch of the "Kooperative Speicherbibliothek Schweiz" and "e-Codices" projects by decision of the Steering Committee Pursuit of the ‘‘e-lib.ch’’ activities by decision of the Steering Committee Process of development of the strategy (overall assessment, priorities, selection)
01.05.2013	Pursuit of SWITCH / AAA activities by decision of the Steering Committee
Late 2013	Approval by the Steering Committee of the White Paper drawn up by the Project Group, including details of the principles and conditions involved in the realization of the projects of the program until 2016, and proposals regarding the structures to be maintained beyond that date as well as their financing
2014-16	Realization of activities, with regular reports submitted to the CRUS. The progressive financing of the various subprojects is made on the basis of strategic control
2017	Sustainability of the structure is established according to the White Paper (following endorsement by the parties concerned).


Gantt chart for 2012 and 2013
2012
2013
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12
Submission of the request regarding SUC program 2013-2016
SUC decisions regarding the programs
Decisions of Parliament regarding the ERI message
Constitution of the Steering Committee
Detailed projects "Kooperative Speicherbibliothek Schweiz" and "e-Codices"
"e-lib.ch" and "SWITCH / AAA" requests for 2013
Steering Committee decision regarding financing for 2013
Launch of the "Kooperative Speicherbibliothek Schweiz" and "e-Codices" projects by decision of the Steering Committee
Pursuit of "e-lib.ch" activities by decision of the Steering Committee
Pursuit of SWITCH/AAA activities by decision of the Steering Committee
Hiring of Project Manager
Taking up of official duties by the Project Manager
Setting up of the national organization
Preparation of the process for development of the strategy
Process for development of the strategy (overall assessment, priorities, selection)
Approval of the strategy

8. Request for contributions related to projects according to the LAU, broken down by category

The figures shown under the five budgetary headings below are in order of magnitude. During the program, it is possible to invest up to 20% of the annual tranche for other budgetary items. The Annual Report must take into consideration the actual use of funds under each heading. If the funds to be reported exceed 20%, a request must be sent to the SUC to obtain its approval.

The distribution of means between the various projects in the different fields of activity will not be known before the development of the strategy and the process of competitive selection planned for 2013. A breakdown of contributions related to projects under the categories requested is not possible until then.

	2013	2014	2015	2016	**Total**
Salaries according to local levels (gross salaries)					
Equipment and installations					
Operating means					
Rental of leased premises especially for project needs					
Meeting and travel expenses					
TOTAL	**5'000'000**	**9'000'000**	**11'000'000**	**12'000'000**	**37'000'000**

9. Breakdown of contributions related to projects between the project partners according to the LAU

The breakdown of contributions between the partners according to the LAU can be modified in the course of the project with the agreement of the partner institutions concerned. The Annual Report must take into account the actual breakdown of the funds.

When a partner decides to leave the program or new partner participates therein, the SUC must be notified beforehand.

The distribution of means between the projects in the different fields of activity will not be known until the development of the strategy and the competitive selection process planned for 2013. A breakdown of the contributions related to projects between the partners according to the LAU is from that time on no longer possible.

University / Institution	2013	2014	2015	2016	**Total**
TOTAL	**5'000'000**	**9'000'000**	**11'000'000**	**12'000'000**	**37'000'000**

In principle, the SER pays the contributions related to projects to the project management or "the leading house"; the latter then distributes the funds between the partner institutions. The reasons for a possible exemption to this rule must be indicated below. In such cases, it is also advisable to specify to which recipients the funds should be paid.

The funds should be paid to the CRUS, which will ensure that they are distributed between the partners of the program, in accordance with the decisions of the organs of the latter.

10. Own funds guaranteed by the partners of the project

The cantonal universities, universities or academic institutions that participate in a program in principle provide their own contribution that is equal to the federal contribution expected (in real money and / or in virtual money); see Art. 45 paragraph 1 OAU (Ordinance on Law on Aid to Universities).

The Swiss Higher Education Institutions own contributions are covered by their contributions to the Consortium of Swiss Academic Libraries (average growth of approx. 5% per year included), which represents CHF 83 million in real money for the entire period (CHF 58 million for the cantonal universities and CHF 25 million for the ETH institutions and the universities of applied sciences) and by their own contributions for the pursuit of e-lib.ch activities, which represents CHF 9 million (of which CHF 1.6 is allocated to the ETH domain and CHF 0.65 million to the universities of applies sciences), mainly in the form of virtual money. The own contributions to other parts of the project therefore probably remain marginal.

University / Institution	Real money	Virtual money	Total	The share of “virtual money” is paid out as follows:
TOTAL amount of own contributions	**82.7**	**9**	**91.7**	

11. Financing: summary

	2013	2014	2015	2016	**Total**
Contribution related to the project according to the LAU (=total, see table in section 9)	**5'000'000**	**9'000'000**	**11'000'000**	**12'000'000**	**37'000'000**
Own contributions from partners of the project according to the LAU	15'000'000	15'600'000	16'400'000	17'000'000	64'100'000
Contribution related to the project – ETH Council	1'000'000	1'750'000	1'750'000	2'500'000	7'000'000
Contribution related to the project – OPET	300'000	500'000	500'000	700'000	2'000'000
Own contributions from the ETH / Universities of Applied Sciences	6'450'000	6'750'000	7'050'000	7'350'000	27'600'000
Other funds from the Confederation (e.g. the SNSF, ICT and others)	n/a	n/a	n/a	n/a	n/a
Third-party services	n/a	n/a	n/a	n/a	n/a
Total costs of the project	**27'750'000**	**33'600'000**	**36'700'000**	**390650'000**	**137'700'000**

12. Signatures

By providing their signature, the Rectors, Presidents and Directors hereby attest that the own funds guaranteed under section 10 shall be provided.

The main applicant for the contributions related to the projects according to the LAU:

Place and date:	Project Manager: Prof. Dr Martin Täuber
Berne, 24 May 2012 ----------	(Signature) ----------

On behalf of all the partners of the program:

Place and date:	President of the CRUS: Prof. Dr Antonio Loprieno
Berne, 30 May 2012 ----------	(Signature) ----------

To be completed if necessary by other signatures!

The request must be submitted (in printed and electronic versions) **no later than Thursday 31 May 2012** to the following addresses:

- **Swiss University Conference, General Secretariat, PO Box 576, 3000 Berne 9**
- **cus@cus.ch**