

Progress of the Architectural Competition: Learning Center, the Lausanne Example

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The slides of this paper can be found at: http://www.zhbluzern.ch/LIBER-LAG/PP_LAG_06/Friday/AymouninRittmBisbrouck-EPFL.pdf

ABSTRACT

Point of entry to the Ecole Polytechnique Fédérale de Lausanne (EPFL), the Learning Center will be a place to learn, to obtain information, and to live. Replacing and improving the old main library, this new building will gradually assimilate all EPFL department libraries collections and services, as they are integrated into a global information system.

Conceived as the place for those who are learning, mainly students, who have no personal working area on the campus, it is designed to adapt itself to the 'seasons' of academic life throughout the year (flexibility and modularity of rooms, extended opening hours during exam periods). It will take into account group working habits (silence vs. noise), changes in the rhythm of student life (meals, working alone, discussions, etc.), and other environmental factors. Of course the needs of EPFL staff and alumni, local industry and citizens have also been carefully considered in the design.

By offering a multitude of community functions, such as a bookshop, cafeteria and restaurant services, and rooms for relaxation and discussion, the Learning Center will link the campus to the city. Areas devoted to exhibition and debate will also be included, enforcing its role as an interactive science showcase, in particular for those technologies related to the research and teaching of the EPFL.

The presentation described the process and steps towards the actual realisation of such a vital public space: from the programme definition to the collaboration with the bureau of architects (SAANA, Tokyo) who won the project competition, the speakers showed what are the challenges and lessons already taken when working on this major piece of architecture, indeed the heart of the transformation of the technical school build in the 1970s into a real 2000s campus.

150 YEARS OF DEVELOPMENT

Since 1969, the Ecole Polytechnique Fédérale de Lausanne ([EPFL](#)) has been located at Ecublens, on the outskirts of the city of Lausanne, Switzerland. In Fig. 1, EPFL is in the foreground, the University of Lausanne ([UNIL](#)) next to it, and in the background lies the western part of Lausanne. Lake Geneva is visible on the right of the picture.



Fig 1: EPFL - General view

Founded in Lausanne in 1853 as the “Ecole spéciale de Lausanne” (Technical School of Lausanne), its name changed several times - first to the “Faculté technique de l’Académie de Lausanne” (Technical College of the Academy of Lausanne), then the “Ecole d’ingénieurs de l’Université de Lausanne” (School of Engineering of Lausanne University), followed by the “Ecole Polytechnique de l’Université de Lausanne” (Institute of Technology of Lausanne University) - before being incorporated into the federal regime on January 1st 1969 as the “Ecole Polytechnique Fédérale de Lausanne” EPFL (Swiss Federal Institute of Technology Lausanne). At that time, it was located in the town of Lausanne and had almost 1,400 students. The number of students has constantly increased. Currently (2004 figures), EPFL has 6,328 students, 206 professors and 3,189 employees – a total of almost 10,000 people.

The decision to move EPFL to its current site at Dorigny-Ecublens, about 10 km west of Lausanne, was taken in 1969, when it ceased to come under the authority of the Canton de Vaud and acquired Swiss federal status. At the same time, the decision was taken to also move the University of Lausanne to the neighbouring site of Dorigny. A national competition was launched in 1969 for the EPFL master plan, won by architects Zweifel+Strickler and Metron. The first building – the Chemistry Building - was inaugurated in autumn 1977.



Fig 2: EPFL and University of Lausanne (UNIL)

	EPFL
	Chemistry
	Uni. Lausanne
	Sports area
	Reserve for extensions

The EPFL campus has continued to develop since 1972, with 3 main development phases : the 1st phase in the East, between 1972 and 1984, the 2nd phase in the Southwest, between 1985 and 1995, and the North Quarter in the Northwest, between 1995 and 2005. These constructions represent a primary usable area (SUP) of 165,000 m² on a total campus surface of 515,000 m².

In 2000, its departments were reorganised into 5 schools : Basic Sciences, Engineering Sciences and Techniques, Computer and Communication Sciences, Architecture, Civil and Environmental Engineering, and Life Sciences, and the College of Humanities was created. A science hub (PSE) has been developed since 1993, and accommodation for students (250 rooms) and administrative staff was created in 1994.

The initial EPFL master plan was revised in 1986 to include the development of the Southwest and North districts. In 2003-2004 EPFL began a new internal study process, focusing particularly on its South district, in order to define the location of major projects under development. The aim was to turn a Technical College into a real campus, a centre of social life offering evening and weekend activities.

This is based on the “social” projects of the Learning Center, student accommodation and a hotel south of the cantonal road, a Congress Centre with the development of a Faculty Club in the North, a Technology Transfer Centre in the Southwest. Their interface position on the edge of the campus demonstrates the desire to open up the EPFL to the city. In parallel “teaching and research” projects are being developed, such as the new Life Sciences building, the installation of a Medical Imaging Centre in partnership with the universities and hospitals of Lausanne and Geneva and transformation of the Chemistry zone.

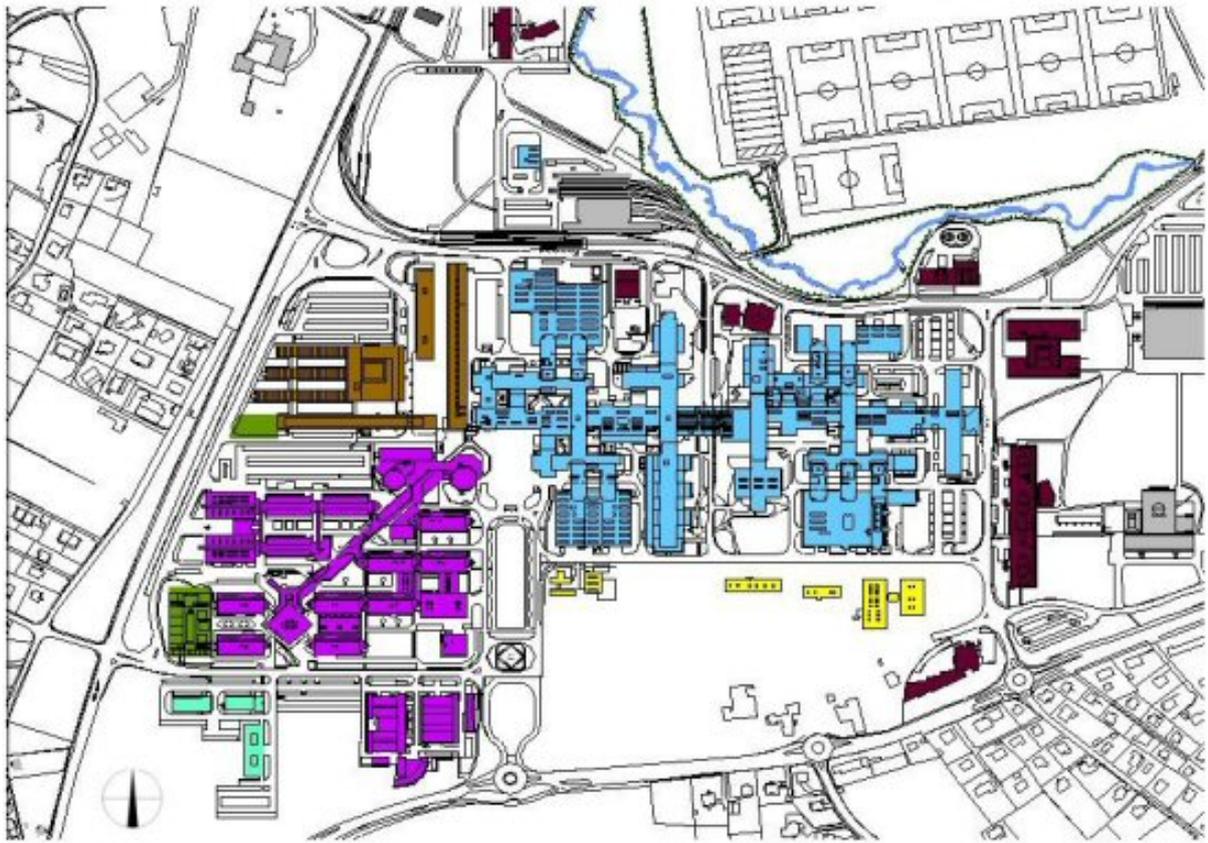
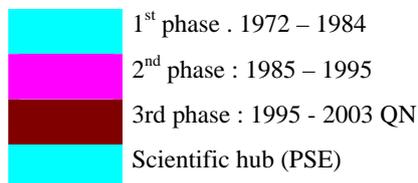


Fig. 3: Development phases



Working area: 165,000 m²
Campus area: 515,000 m²

The aim is to improve coordination of the development of the EPFL and UNIL campus, with UNIL “Social and Human Sciences” to the East and EPFL (and partly UNIL) “Science and Technology” to the West, organised around 2 social “greens” facing South towards the lake and Alps. UNIL and EPFL students and staff share the lakeside sports area.



Fig 4: The EPFL-UNIL ““double banana”

EPFL 2010 – A VISION FOR THE LIBRARY ... AND THE CAMPUS

Since the turn of the century, the EPFL has evolved from a school of engineering into a technical university, training engineers mainly at Master and PhD levels. Ranked among the top ten European technical universities, EPFL now has the ambition to be one of the best in the world thanks to its research output. It has adopted the [Bologna system](#) and is transforming its academic structure to attract the best international students through its high quality-learning environment. “Make students the entrepreneurs of their knowledge” is the maxim.

In 2010, EPFL will teach 7000 students (4000 Bachelor, 2000 Master, 1000 PhD) and employ 2000 scientific staff.

The library’s current ‘assets’ are as follows :

- 50 fte librarians
- 500,000 research books, 15,000 course books, either printed or electronic
- 6,000 electronic journals, 100 databases, 2,000 ancient and precious volumes
- Acquisition and subscription budget: 2 million Euros / year

Vision “Library 2010”, and thus “campus 2010”:

The President wishes to build the library of the future. It must become the heart of the campus, active 24 hours a day. It has to be a place for living and studying, mainly for students but also researchers and the general public. The Learning Center will include a library, work areas, cafes and restaurants, as well as facilities for various events.

This new building, a real Learning Center (LC), or “extended library”, will be a focal point at a regional or even national level, and an entrance point to the campus. It will offer a good balance between activities in the LC and life throughout the campus. Fig. 5 illustrates this concept.

Library and campus 2010

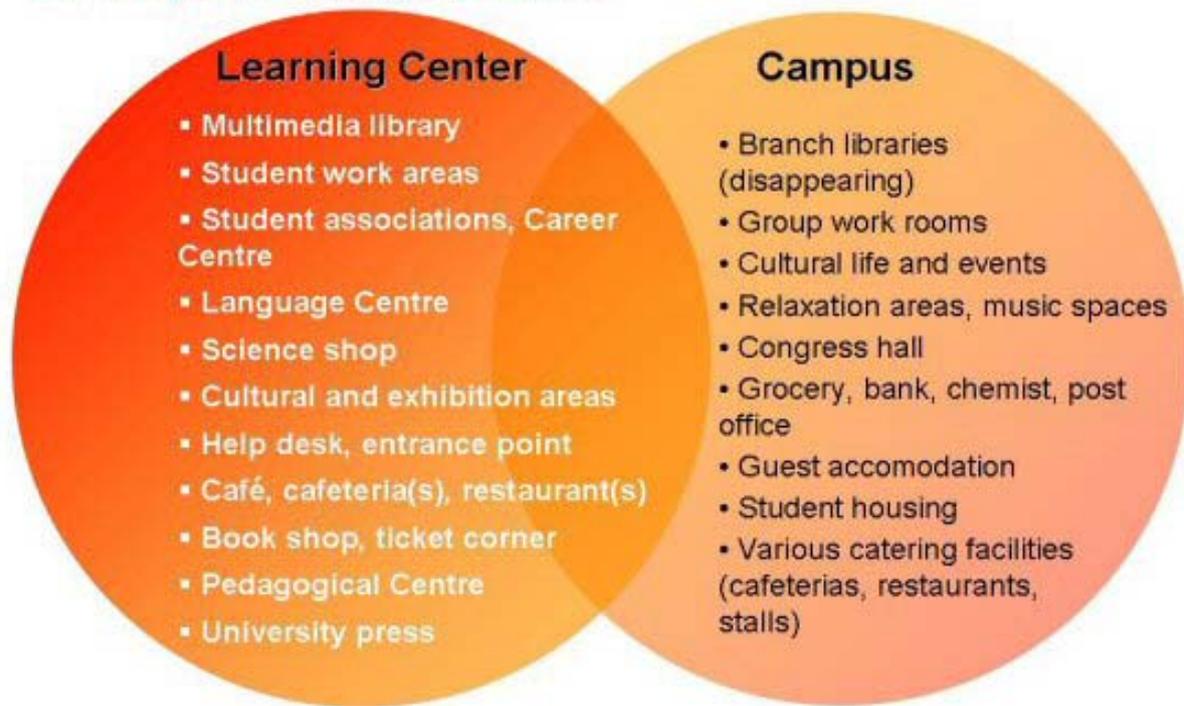


Fig. 5: Vision 2010, EPFL Learning Center and campus

PROGRAMME & COMPETITION

In order to gather the widest possible range of ideas, EPFL organised a 2-stage architectural competition in spring 2004. The competition was open to architects worldwide and advertised in specialised publications. The Experts Committee selected 12 groups, based on their international reputation and experience in library projects and developments to participate in a parallel study commission (architectural competition with presentation of projects by candidates), with pre-qualification procedure. The selection process by the Experts Committee took place on November 24, 2004.

The initial architectural programme is summarised below:

1. Library/scientific information services: information desk, multimedia library, research collection, 700 student workplaces, 40 librarian workplaces and offices: 6,160 m²
2. Training and teaching: training rooms, pedagogical centre, language centre: 1,150 m²
3. Living spaces: main hall, help desk, café, restaurants (self-service and smart), alumni and student lounge, shop: 1,875 m²
4. Cultural spaces: exhibitions, multipurpose hall, bookshop, university press: 1,690 m²
5. Technical spaces: delivery service, EPFL archives, technical rooms, car park: 3,500 m²

More details of the architectural competition can be found on the website <http://learningcenter.epfl.ch>

At the planning level, the aim was also to develop a more global strategy, comprising a development concept for the entire EPFL South sector, incorporating a greenbelt area for social activities and relaxation, and ensuring its complete integration into the campus as a whole. Two sites were defined: a competition site for the location of the Learning Center project, and an extended competition site for proposed connections to the rest of EPFL.



Fig. 6: Competition sites

The projects were evaluated according to the criteria below by the Experts Committee, appointed by the Contracting Authority;

- EPFL:
 - Mr Patrick Aebischer, EPFL President
 - Mr Francis-Luc Perret, EPFL Vice-President for Planning and Logistics
 - Mr David Aymonin, Head of EPFL central library
 - Mr Patrick Berger, architect, EPFL professor
 - Ms Inès Lamunière, architect, EPFL professor
 - Mr Martin Steinmann, architect, EPFL professor
 - Mr Jacques Lucan, architect, EPFL professor
- External members:
 - Mr Daniel Borel, President, Logitech International
 - Mr David Chipperfield, architect, London
 - Mr Mike Guyer, architect, Zurich
 - Mr Jeffrey Huang, architect, Harvard University professor
 - Mr Charles Kleiber, Secretary of State for Research, Bern
 - Ms Anne Lacaton, architect, Paris
 - Ms Brigitte Shim, architect & University of Toronto professor

The Experts Committee was assisted by specialists for the evaluation of certain specific aspects of the projects, such as:

- Library Science:
 - Ms Marie-Françoise Bisbrouck, Head of Joint Documentation, Department, Sorbonne University, Paris
 - Mr Mel Collier, Head of University Library, KU, Leuven, Belgium

- Pedagogy: Mr Pierre Dillenbourg, EPFL professor
- Building energy: Mr Pierre Chuard, EPFL professor
- Cost analysis: SGC, Geneva

From 189 applications from 23 countries and 5 continents, the jury - or more precisely the Experts Committee in this case - selected 12 groups to participate in the parallel study commission:

- Abalos & Herreros, Madrid, Spain
- Ateliers Jean Nouvel, Paris, France
- Diller Sofidio + Renfro, New York, USA
- Herzog & De Meuron, Basle, Switzerland
- Livio Vacchini - Eloisa Vacchini, Locarno, Switzerland
- Mecanoo Architecten, Delft, the Netherlands
- OMA Stadebouw BL, Rotterdam, the Netherlands
- Pierre Du Besset & Dominique Lyon, Paris, France
- Sanaa, Kazuyo Sejima + Ryue Nishizawa, Tokyo, Japan
- Valerio Olgiati, Zurich, Switzerland
- Xaveer de Geyter, Brussels, Belgium
- Zaha Hadid, London, United Kingdom

The procedure was similar to a competition, with participants presenting their proposals before the Experts Committee.

Each project was evaluated according to the following criteria:

- Interpretation of the subject, respecting of the competition programme.
- Insertion into the site and quality of connections with EPFL buildings and surroundings-
- Quality of external spaces and their relationship with built elements.
- Quality of internal spaces and spatial organisation.
- Flexibility of layout and functional qualities.
- Cost analysis of the project.
- Energy performances of the project assessed from sustainable development angle.

OVERVIEW OF THE 12 PROJECTS

For legal reasons, we have not reproduced here the images and sketches submitted by competitors, Nevertheless a full gallery with drawings, maps and pictures of models for each project is available on the [EPFL Learning Center](#) website.

The SANAA winning project

An excerpt from the Experts committee's report on the SANAA project: "The project offers an interesting prolongation of and analogy with the philosophy adopted during the first stage of EPFL's construction: *importance of itinerary, movement, interior courtyards with different surroundings, atmospheres, richness of vegetation, uniqueness and unity whilst still creating diversity...* The proposed programme offers a new living space, opens up the possibility of new teaching approaches, everything being integrated into one single building as place of assembly and breeding-ground for *enriching encounters and synergies...*"



Fig. 7: SANA architects, and virtual aerial view of Learning Center, EPFL and Lake Geneva

The main areas and functions are depicted in the next figure. For more details, please refer to the Liber Architecture Group's brochure, *Description of new University and Research Library Buildings in Europe*.

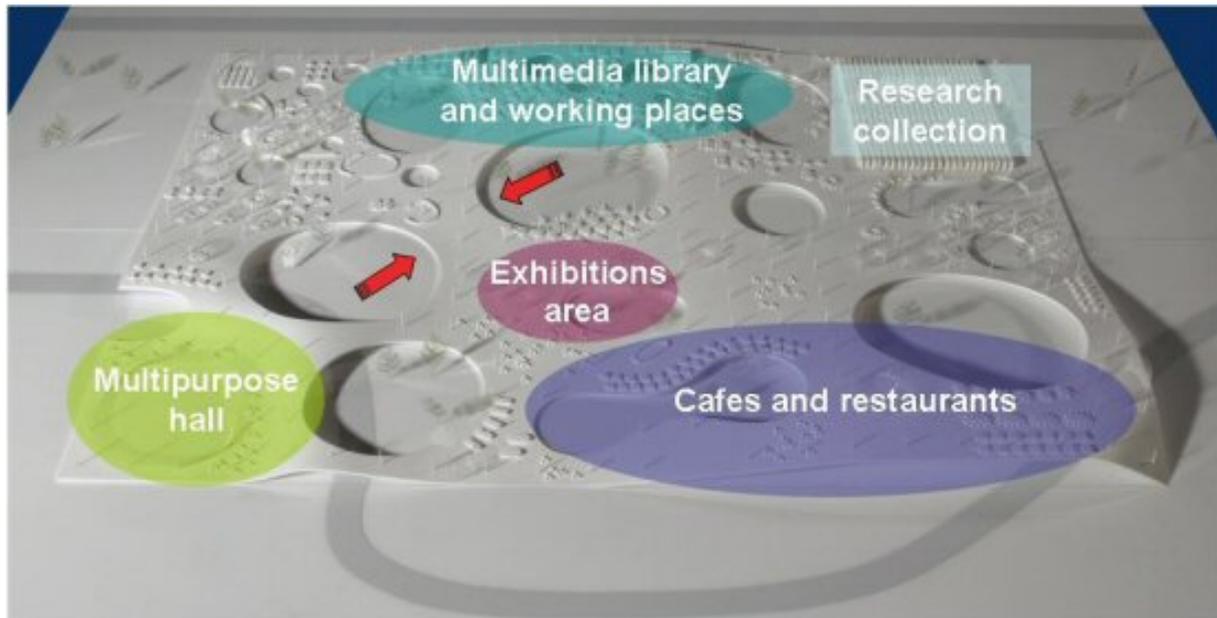


Fig 8 EPFL Learning Center. Main functions and entrances, SANAA project (competition layout)

PROJECT DEVELOPMENT AND PLANNING

Evolution of the detailed programme - Focus and User Group input

In this section we explain how the needs of future users were defined and supported in a process that should transform - in a given physical, social and economic environment - the architectural vision into a real, beautiful and functional building.

Stage 1

The Learning Center project was born out of a “Presidential vision”, based on what most “Anglo-Saxon” universities are already doing: creating a place for living and studying, mainly for students but also researchers and the general public, including a library, work areas, cafes and restaurants, facilities for various events, and so on.

After the Ticer audit of EPFL Libraries in 2001, the initial project team (“Agora”) started defining the objectives and scope of the project, and visited several “Learning Centers” in the Netherlands and United Kingdom. After a 2-year development phase, the decision to build the Learning Center was made by the EPFL authorities in April 2003. The architectural competition took place in 2004 to select the architectural group who would carry out this “flagship” project.

Stage 2

To define the architectural competition programme, the Presidency commissioned the Head Librarian and his deputy to consult potential users. We organised numerous meetings with Focus Groups of approximately 9 people, made up of librarians, students, researchers and PhD students, professors and lecturers and other “independent” participants. This consultation had the following objectives:

- identify the degree of acceptance of the intended reforms (teaching methods and scientific information),
- elaborate the programme for the Learning Center,
- outline changes to be made to the EPFL campus in general.

The groups appreciated the consultation process. They expressed interest in continuing the dialogue in order to eliminate any blockages and frustrations that might result from the restructuring process at EPFL and better explain and discuss the intended reforms.

According to the Focus Groups:

The “Learning Center” should:

- be the entry point, the meeting place for EPFL; the “city centre” and hub of various networks; an orientation platform; a place of cultural life, offering a variety of atmospheres
- favour friendliness and the human scale
- be neither ghetto nor monument

The campus should:

- become more urban (like a “city”, with districts, main square, ...);
- be better sign-posted;
- contain small areas for eating, working, relaxing, resting, ...;
- have broader access rights and extended opening hours;
- have a better defined cultural policy;
- provide associations with better facilities, budgets, ...;
- include guest accommodation.

Other suggestions:

- create a “community council” to conduct the debate and provide greater transparency,
- create a body of professional librarians,
- encourage their continuous professional training,
- boost exchanges and create interfaces with the University of Lausanne (UNIL).

The conclusion of the Focus Groups was: the Learning Center project should be expanded to a “Campus for Tomorrow”, of which the “Library of the Future” is one element.

The detailed discussions with and recommendations from potential users resulted in the list of premises, which was given to participants in the 2nd competition phase, the parallel study commission with pre-qualification procedure, as described above.

Stage 3

In parallel with the selection of the winner by the Experts Committee, and during the first phase of the preliminary studies (November 2004 to end of March 2005), we continued to fine-tune programme data through discussions with user groups for the various facilities:

- Library
- Training spaces
- Events / Campus
- Publishing / Bookshop

Each group, of 5 to 9 participants, met a number of times and produced “Sheets” for each facility with detailed descriptions (see Fig. 9 for an example: Multimedia library).

Definition of functions:

Area: 1.3 a Multimedia library : Free access 1.3 b Reading and individual work area				
What's done there (use)? What's it used for?	To whom?	When? How?	Characteristics (size, access, atmosphere, colours,...)	Equipment
1. Storage for collections selected for free access	Staff members	Collections of books classified by subject, regularly updated Access to collection 24 hours a day, 7 days a week	Collections kept away from daylight to preserve books Organised by subject The various media are mixed together (books, CDs, DVDs, etc.) Several different areas An area is reserved for printed periodicals Good signposting	Furniture that can be easily assembled and dismantled by library staff. Must be easy to buy more. Shelves not too high Bookshop-type display unit, low shelves -> used to present novelties or specific themes
2. Gathering information, searching by topic (people "rummage")	Library users	By wandering round the shelves, following simple signposting	Allow sufficient space for two people, face to face (or back to back), a wheelchair or trolley of books.	Catalogue consultation terminals, baskets, trolleys, provide places for depositing books after use
3. Giving information to users, answering specific questions	Library staff	Easily visible and signposted, so that users can quickly locate these information desks	Approx. 6 information desks scattered throughout the library	Desks with 2 seats, open, approachable for users. Comfortable chairs

Fig. 9: Example of facility sheet

In parallel, the general list of premises was updated, and accompanied by a functional layout (see Fig. 10) showing the relationship between the various parts of the Learning Center, as imagined and desired by users. All these documents were submitted to the architects at the beginning of April 2005.

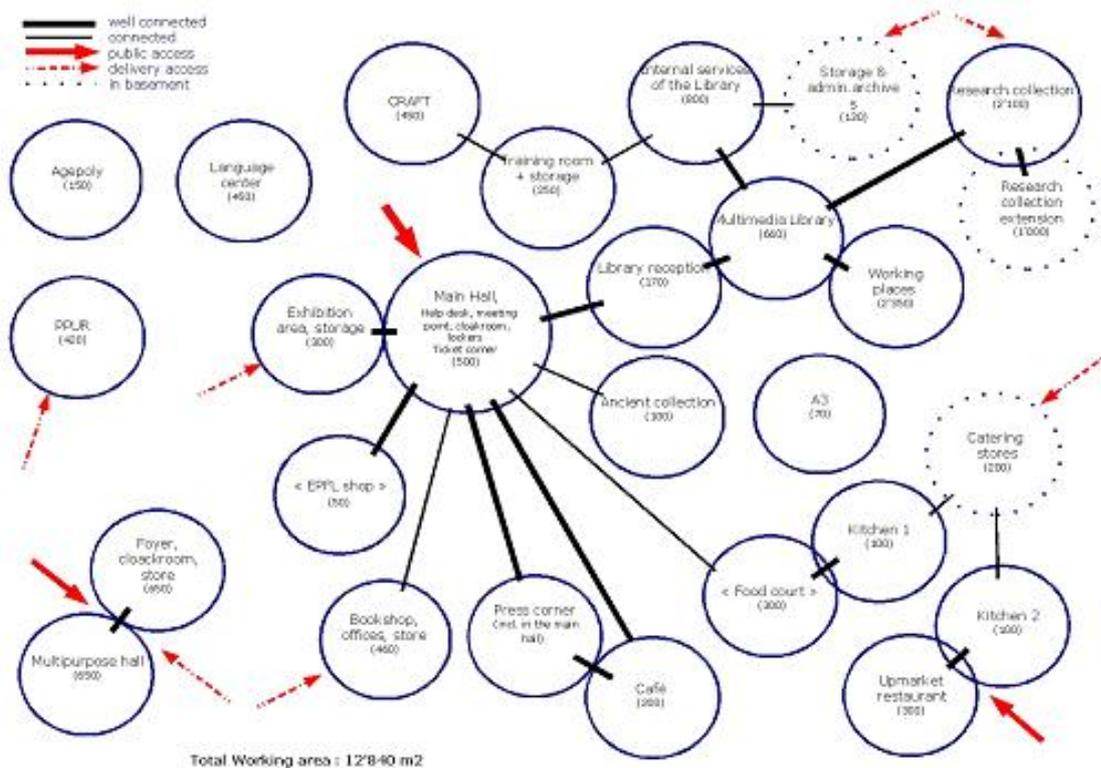


Fig. 10: Functional layout of Learning Center

Stage 4:

Monthly meetings were organised in order to fine-tune the project and match the architect's vision to the requirements of users and EPFL technical services. About 6 months later (October 2005), Sanaa produced a pre-pilot project, which was examined in detail by everyone involved (various users, co-ordinated by the Central Library management, and technical services, co-ordinated by the Building Department). Following the numerous comments and recommendations, Sanaa is in the process (until the end of March 2006) of adapting the pilot project. At the same time, a call for tenders for Total Service Contractor Services has been launched. The selection should be announced in June this year. This company, hand-in-hand with the architects and engineers, and supervised by the Building Commission, will be commissioned with the final construction design project, starting October 2006.

The administrative authorisations should be obtained by the end of this year (2006), and construction works are scheduled for 2007 - 2008. The project should be jointly financed by the Swiss Federal Government and private sponsors. The 4 project development stages are shown in Fig 11.

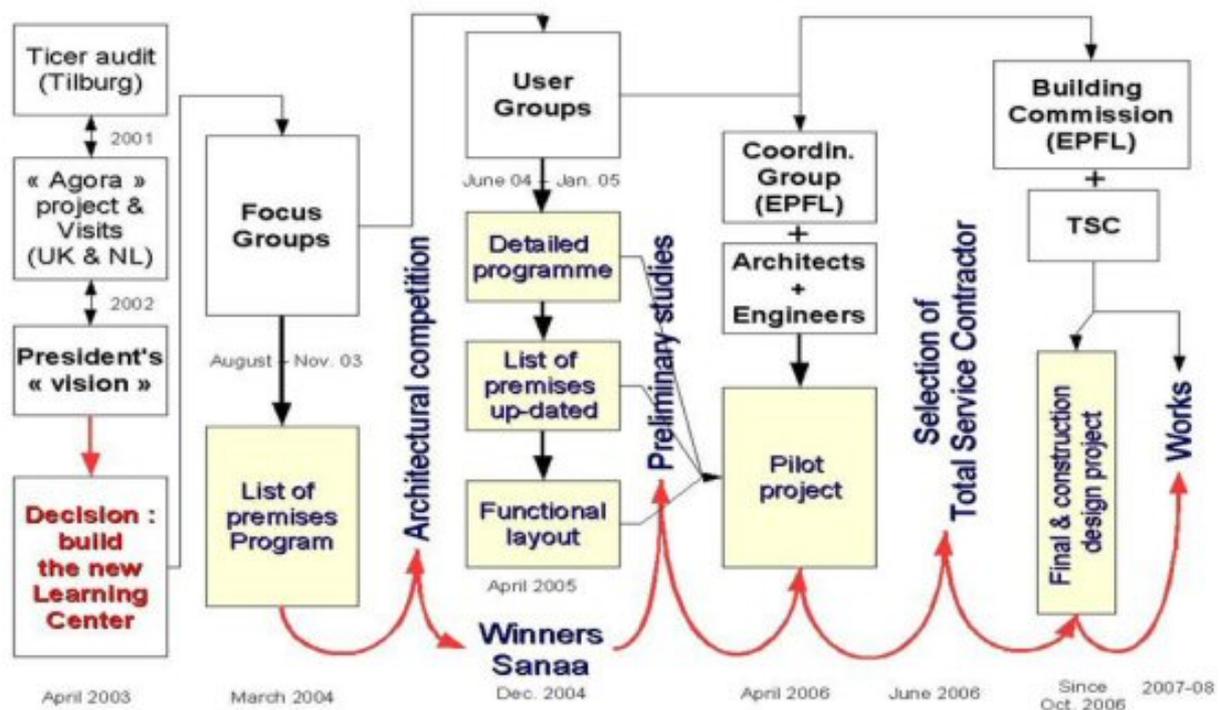


Fig. 11: Development and planning chart

The Sanaa project - functional and technical challenges

The functional and technical challenges of this very distinctive project were already identifiable at the competition stage, since they were inherent in the fundamental design characteristics. These are primarily:

- Flexibility and variable slope.
The poetic aspect of the project, residing in the “undulating wave”, implies certain restrictions as to its use: on the one hand, restricted accessibility to a large part of the public areas (disabled, transport of books, and so on) and on the other, limited flexibility. During project development (since the competition), the cost cuts requested by the Owner led to a reduction of the building's size. This, combined with the result of the civil engineering calculations, has resulted in the slopes becoming even steeper. In addition, the location of the various functions in relation to the areas “on top or in the troughs of the wave” has repercussions on the flexibility of usage.
- Open plan and accessibility 24 hours a day.
Security and privacy requirements should be taken into account while retaining the project's transparent and open nature.
- Irregular slab in shell.
The concrete shell develops multidirectional spans of over 80 meters without intermediate supports. At the

same time, it must provide both the utility and energy services for the building, and thermal insulation from the ground.

- Double curvature glass panels.
The patio glass panels have an elliptic curve and their lower and upper edges (in cross-section) are adapted to the movements of the floor-shell and roof, resulting in each element having a specific form. They must also satisfy solar protection requirements.

TOWARDS THE FUTURE

The Lausanne Learning Center is a very special project for a new type of academic library, combining important social functions with the redesigned services of an information commons. The building is also unique in its design and may be considered an example of what could be called XXIst century architecture. Its design and building represent a real challenge for the EPFL community, but we are confident in its ability to fulfil the needs of its future users.

WEB SITES REFERRED TO IN THE TEXT

Bologna Declaration of 19 June 1999. http://www.bologna-berlin2003.de/pdf/bologna_declaration.pdf

EPFL - Ecole Polytechnique Fédérale de Lausanne. <http://www.epfl.ch/index.en.html>

EPFL Learning Center: Building the Future of Learning. <http://learningcenter.epfl.ch/>

UNIL - University of Lausanne. http://www.unil.ch/central/page2192_fr.html