The learning landscape is a landscape in which users find all elements necessary for learning. Information and knowledge, but also administration, infrastructure and other basic elements needed for study and research will be present in the landscape.
The learning landscape is also a landscape that has the ability to learn. The landscape grows, gets to know it`s users and becomes more intelligent.

Philosophy and Goals

ETH World will lead the ETH in its journey to link worlds of knowledge. Link virtual and physical worlds, link research and learning worlds, link disciplinary worlds, link the ETH with the whole outside world. Through highly sophisticated information technology and stable dynamic information structures the ETH can evolve its knowledge to a world leading hight. By making knowledge visible the ETH will maintain its reputation as a well known center for research and learning, a true learning landscape.

The learning landscape will pursue the following goals:

- Build a highly flexible and self-evolving information structure, which opens up all knowledge resources at the ETH.
- Link physical and virtual worlds for better interaction and synergy between both of them.
- Navigate internal and external visitors of ETH world smoothly and efficiently through the landscape.

Strategy

To reach the formulated goals ETH World:

makes knowledge visible and usable

The contextualizer forms the foundation of the ETH World. The contextualizer opens up new knowledge sources and brings knowledge to the members of ETH World. Placing the knowledge in the right context helps the members using the information in their learning process.

links virtual and physical worlds

Bringing the virtual and the physical world together will lower the barrieres between them. People will be stimulated to use all aspects of their learning surroundings. In the end ETH World is one learning landscape.

supports personal needs

ETH World is flexible and is easily adjustable to the personal needs of its members. The *bees* are personal assistants and become more and more intelligent when used. They will bring the right information to the right person. They also help people to feel at home in the learning landscape, since all members can communicate with each other.

is self-organising and interdisciplinary

All members of the ETH World develop and live in the learning landscape. Decentralised development makes sure that all members of the ETH can access and change the landscape. Different disciplines will meet in ETH World and will use each others knowledge.

Looking at the learning landscape through the Contextualizer

Each individual at the ETH has to decipher a growing mass of scientific knowledge. Although the internet makes data technically spoken widely accessible, it is difficult to find the right information when you need it. By using information technology for interactive visualization the learning landscape can disclose knowledge to students and teachers in a more natural way. The intuitive interface allows constant comparison and evaluation. There is an individually regulated continuous flow of information instead of a sequential picking up of disconnected pieces of data. The System allows each member to experience the intellectual power of the ETH as a vast community with enormous human potentials. The student and scientist become the navigator of his education or research and not the passenger of a predefined track. Information is not anymore sequentially listed or spread on brand dominated websites but flowing in an open space that is potentially unlimited. The user with his own research activity develops magnetic attraction to regulate the flow of data, each member experiences his own impact as a participant of learning community. Context is more valuable than information.

The Contextualizer is an integration of two basic concepts of graphical representation of data. It is spatially organised as well as graphically mapped. The spatial representation with the *C.L.O.U.D* allows making large amounts of information with higher complexity accessible to learners and researchers. The *Context Maps* make this complexity understandable and facilitate their use in a more familiar way of graphical navigation. The maps allow information to be veiwed by context-navigation within different contexts: topics, people, faculties and places.
Both navigational methods through space and on maps are simultaneously working, the maps being transparently laid over the *C.L.O.U.D*

C.L.O.U.D.

The *Contextual Learning Objectoriented Userdriven Database C.L.O.U.D.* is a multi-dimensional index that shows the infinite mass of data in a comprehensible way. This intuitive interface allows users to choose relevant data and at the same time to see this data in it`s overall context. As a meta-database, comparable to internet search-engines, it is a powerful visualization of all of the knowledge of the ETH and the growing amount of relevant data on the internet.

To make information visible from far and group it into categories the C.L.O.U.D. is represented as a large number of moving objects. From far it looks like a dynamically structured cloud. Orientation in the *C.L.O.U.D.* is provided by three different features of the objects: position in space, appearance of the object and dynamic behaviour.

Objects in the *C.L.O.U.D.* are defined by meta-Information: Information about information (like content, author, title and library location of a book). Those are building the position, appearance and the dynamic behaviour of the objects. Many of the meta-informations about objects are already defined within their position in the Four Contexts (like the Members, Location and Research Topics of an Institute). Other more specific information can be defining the appearance of objects once they are more closed.

Technically speakink the C.L.O.U.D. is a vector space model. A classification method is needed that relates the objetcs to each other. Objetcs with related information can be found easier when compared on a basis of such a classifying method. A vector space model using descriptors to specify documents allows such a classification. The descriptors span a n-dimensional information space where each document measured through the descriptors has its specific position. Closely related documents handling common subjects thus are close to each other in this space. Contextual relationships can be achieved by regarding neighbouring nodes in such a space.

The ***position*** of information objects is defined by the context. Pieces of information are indexed as *database objects* and visually organised in space according to their contextual interrelation. Groups of Objects are forming associative clusters that appear like clouds. Clouds are subsets of larger contextual clouds that all together build the *C.L.O.U.D.*, the database of all objects. Sets of contexts build visible entities of the Cloud. Density means contextual coherence.

The ***appearance*** of the objects is modulated by specific attributes of that information. The shape of different morphological types relates to the type of data. Objects types can be information about institutions or services, certain themes, people or places. They can also be links to multimedia content of the WWW or represent teaching events or real objects like lounges, lecture halls or books. The list of object types is extendable with the development. All those are types recognisable by their shape. The glow intensity of an Object is an indicator of time related attributes of the object like actuality . The opacity is defined by different feedback statistics to indicate values like general relevance or user satisfaction of data.

Since the contextual interrelation of the objects can change according to which of the four modes of context is chosen by the user the ***dynamic behaviour*** of an object is the third parameter. Objects can have a gravitational pull towards what is defined by their relevance to the four basic categories people, topics, places and faculties. They can also move on a specific track if the user changes his position. The model is permanently re-rendered according to the movement of the user through the context. On the screen a user driven perspective appears that shows a space which is permanently transforming.

Associative Paths

The user's search paths trough the *C.L.O.U.D.* are automatically tracked by the system. These paths can be used like personal bookmarks of a internet browser, but they also provide another tool to visualize connections between pieces of information.

The structure of the *Contextualizer* is designed as a growing collaborative memory for all users with a transparent automatic document classification. Members of the ETH can also fill in an online mask of

the context retriever to actively put their information onto ETH World and define its library services. Other professional scientific classifiers can also use that context retriever to structure their data. The *C.L.O.U.D* is constantly evolving through the interaction with the users, whether they are active authors or more passive users. The maps provide an easy to use graphical interface which is familiar to all users of contemporary PC applications.

The Cloud is visible on interfaces and in several physical spaces and at the same time it is a representation of the intellectual activity of the ETH as a whole. Like that activity it would be absurd for one person to want to understand it completely. This is why the blurring of the glow of objects into Clouds is used as a means of abstraction. It is not necessary to have a complete understanding of the Cloud to use the database but it gives a broad impression with touch and feel interactivity. This integrates each user into the ETH community. The appearance of the C.L.O.U.D. is ever changing and not predictable, the design in this presentation is only a hypothetical prediction and should not be taken too literally. As a model it is a representation of objects that makes relations and functions understandable.

The Four Context Maps

To facilitate orientation the structure is explained by maps, that are transparent overlays through which the user can read the C.L.O.U.D.

The ***places*** context helps to link the virtual and the physical world. It is especially useful for online learning. Users can not only see a virtual study environment, but also know where the actual event takes place. They can join in or maybe they just want to ask a question to somebody who is attending a specific meeting.

People with their mind and soul are the heart of the ETH World. This map arranges the information according to the people. The user finds people, sees the members of the faculty, finds experts and sees who is present. This context displays people most related to the information the users are looking for and gives information about the author of a website, or about the references that are made. It displays people which are experts in the field the user is investigating. It helps to identify the person behind the information. Who wrote the website, who is the reference and what is their relationship to the ETH?

This ***topics*** context relates the ETH to the rest of the world. By structuring the ETH's knowledge in a globaly used manner, information between ETH and the rest of the world can easily be exchanged. ETH's knowledge will be accessible to the whole world, a basic need for a leading university. The members of ETH also benefit from this worldwide used information structure because it makes information seeking and international cooperation easier.

The ***faculties*** context is especially valuable for members of the ETH or other academic institutions. Since the faculties are the backbone of the ETH they form a vital information structure which lets members of the ETH find their way around their virtual community.

Bees

Bees are personal assistants, they support individuals in using ETH World and enhance communication. They are powerfull agents designed to make ETH World and personal, easy to use network surroundings. The Bees visualize the evolution of the scientific community ETHWorld and open it up to the world. By integrating specific tools for team work, communication, feedback and searching into the user interface ETH World becomes a complete learning environment for students and teachers.

Bee Nice

Bee Nice makes your virtual presence visible in the ETH World. Bee Nice will represent you when you visit a website. You meet other visitors in real time and real space. You can talk to them, like you would communicate with someone you meet on an exposition or in a lecture, the content of the page offering a theme to talk about. Out of the conversation you could get information and tips that are not found on the website or even on the internet. Every Bee Nice carries the name of the person he represents or tells if it's a student, teacher, researcher etc. If you want to make a personal remark to a specific bee, you can whisper. Bee nice is a subtract from chat environments and enhances communication between visitors in an interdisciplinary manner.

Bee Critical

This Bee leaves traces on websites with personal statistics, critics and comments. You can view other user's comments and see which other persons have visited the site. This gives you an overview of the relevance of the specific information to other people. Bee Critical is a useful tool for an online study environment. It is a database driven application that keeps track of the Bee's actions. If a user calls for

some information, it is recorded by the database at the ETH World, which in turn, returns the historical traces of that specific information to the Bee. The user can add comments about the information or make comments on comments made by other participants. The relevant feedback information, which is collected by Bee Informed can be used to make a statistical statement about the entity.

Bee Informed

Bee Informed is a highly sophisticated assistant that helps users find relevant information on the internet. This information agent works with a complex user-profile to filter the right information from the internet. The Bee can simultaneously perform different search tasks. A union of different tools helps to personalise the search and more specifically to personalise the flexible outcome of the searched information.

Depending on the user-defined time interval Bee Informed searches for one hour, one day or one week for relevant information. The Bee starts his search in a classical manor and works like search engines that either have a big database of index keywords (Altavista) or search engines that value websites by the amounts of links that refer to a specific page (Google). Bees that are send away for long search activities also look at the content of the pages. Other search elements like amount of visitors or experience of the author can be included.

User-profile

Bee Informed analyses the user-profile and uses it to determine what kind of information the user prefers. The user-profile is created out of a combination of user based criteria and criteria that are extracted out of the documents that are visited. User actions on pages like creating bookmarks, saving and printing webpages or giving comments via Bee Critical are recorded as user-articulated interest for a certain page. In the feature extraction phase the page is analysed to determine what makes this page interesting for this user. This information is stored in a vector-form that describes the user-profile. Keywords are filtered through different algorithms that check the title of the page, the meta-tags, term-frequency or analysis of significant words through Porter suffix-stripping. Preferences for words are statistically ranked and are recorded together with combinations of synonyms and generic terms and topics. Another factor of relevance is the users evaluation of proposed pages.

Bee Informed sets of with the necessary information and collects the data in a pool of objects that the user can look at later or store as a list of bookmarks. The chosen information the Bee brings into the pool can be narrowed down through flexible criteria determined by the user. These criteria tell the Bees more about his user and will help expand the user profile. The choice of the user has impact on related topics by influencing the “score” of these entities in indexed databases of keywords, which would help other users searching for the same topic.

Bee guide

Bee guide gives users an opportunity to see ETH World at a glance. A guided tour through the contextualizer and an overview of the functionalities of the different Bees helps users to make optimal usage of the possibilities of ETH World. Next to this guided tour this Bee brings the latest news about the ETH and ETH World. Editors from different disciplines write about interesting developments in- and outside the ETH.

Bee Teamed

To encourage multidisciplinary research and collaboration there will be self-organising rooms on the internet for all types of study processes. Bee Teamed helps you to integrate classes, conferences, research and other more traditional study environments into the virtual world. Next to these more traditional study environments, there is room for non-hierarchical open source research projects.

Bee Teamed offers the opportunity to create easily built study environments. Virtual and physical elements are dragged and dropped into your own virtual room. XML (a sophisticated extended web language) will be used to provide pre-designed spaces, that can be filled with e-mail and discussion list, bulletin boards, forums, chat, cartoon chat or multi user enviroments (MUD’s). Interaction with the physical world like the usage of a booked classroom, arranging beamers and videoscreens will also be online actions.

The research rooms are also used to constantly develop new features for the information technology. Web Warehousing, data-mining and other techniques will be developed and used in the study environment.
Another task of Bee Teamed is to makes it possible to distribute process intensive tasks over the net. This way time consuming tasks are done by as many computers as possible. Of course only computers, that are sitting idle will be used.

ETH World Interfaces and Physical Spaces.

Easy access in public areas
The main idea of all ETH World Interfaces and Physical Spaces is to make ETH World easy accessible and integrate it into the everyday life, the teachers and students. Therefore the interventions concentrate on the public areas to avoid that the interfaces and people working with the computers are banned to separate, uncomfortable special rooms far away from the public life of the university.
ETH World terminals and lounges will be placed in the frequented areas like the public zones or in the heart of laboratories, studios and study rooms. Students will be able to use ETH World as easily as they use a pen and paper but will have access to their own data, and the whole knowledge of the ETH and the Internet wherever they are in the ETH.

New Installations are proposed where there is a chance for establishing a new practise for work, study, or teaching. In all other cases ETH World should integrate the existing and planned infrastructure of the ETH which is one of the best in the world. Those adaptations can be achieved by integrating the software for ETH World which is based on standard technology that operates on any platform.

NEW INSTALLATIONS

ETH World Activity Display
In the Main Building (HG) a spatial electronic installation displays the virtual space of ETH World and the activities in it. It consists of a three-dimensional matrix of mobile light units each light source representing a domain or institution.
The light units will not be associated with a specific domain, but change their position and references as the virtual space of ETH World will change. The matrix will cover the hall‘s ceiling and as a whole will render a three dimensional model of ETH World in the best possible resolution based on the three-dimensional data, that is generated for viewing the clouds in the virtual space. Therefore the vertical position of every light unit can be adjusted to that three-dimensional model. By changing their vertical position the light units can form a two-dimensional display or disappear into the ceiling when the space is used for other purposes. During the busy day time the lights will be lifted up to keep the walking areas free. The intensity of the light units corresponds to the activity of a domain (updates and hits).

The light units describe light- and in-between-spaces within the hall of the main building. The people moving through the hall can explore them. When the hall is not too crowded the matrix as a whole could be lowered so that people have the opportunity to actually move through those spaces.

Every light unit consist of a light bulb and a shutter that regulates the emitted light intensity as well as the direction of the light.

A similar activity display could be installed at the H nggerberg for example in the Physic Auditorium building‘s foyer.

Lounges: Team Work Environments.
Computer work tends to individualise the working routine, limiting teamwork to discussions before, after or while people work on separate terminals. Unlike working in a network of several PC's where each user works in a closed working environment, the ETH World lounge provide the opportunity for real team work with computers. The users share one big desktop display, which combines all user's desktops. The horizontal desktop is connected to a fixed number (6) of integrated terminals which can be increased by login laptops via cable or wireless WLAN.

Of course the terminals allow to browse ETH World and the Internet. Moreover all users of a lounge share a desktop as a common virtual space (as well as the physical one). Herein they have the possibility to share applications and documents, which can be viewed and worked on by all users simultaneously. In horizontal position the system devides the desktop into the six areas for the several users, working documents and windows can be moved and enlarged and shared all over the desktop. Each user can control the mouse, keyboard and on-display light pens over the whole desktop.
For the application were three-dimensional working environments make sense (like chemistry or architecture) the display could be combined with shutter glasses for each terminal so that the desktop becomes a virtual working space.

These lounges are associated to every department. When the desktop is not used as such it will rotate in a vertical position and lift up, then displaying what is happening in the associated virtual section of ETH World. Those shows are automatically driven and would find the sites that have been updated most recently.

BeeThere: Door Labels

Each room's door is equipped with a interactive door label. Their display is connected to the room administration server and shows the bookings of the assigned room over the day. Consisting of a simple monitor and a simplified three button (up, down, enter) input unit, the student could also see the bookings for other days and the location of other courses taking place at the same time.

ADAPTATION

Information Terminals.

The information terminals will be mostly used by visitors who might not be familiar with ETH World. Therefore they are based on a very simple and well known hardware consisting of a monitor, a keyboard, and a track-ball to browse ETH World. The browser can be used as a search engine and help to find visitors to find their way around the building in which they are (places-mode) or to find people or institutions they are looking for (people).
In addition to the keyboard a telephone receiver allows to call the information desk or internal telephone numbers that can be taken from the ETH telephone book integrated in ETH World.

Presentation Spaces

In specific locations (i.e. the Visdome in the Main Building) multi-media presentation spaces are already installed. The audio and visual systems installed in there will be connected to terminals allowing to access ETH World intranet so that presentations (films, images, text, graphics, sound files) can be prepared and accessed by the lecturer during the presentation. Material from the www and ETH World can be integrated by links.
Those spaces would be equipped with microphones for the participation of the audience.

Lecture Halls.

Some lecture halls are fully equipped for an integrated two-way multi media communication. Large screens for projections and an audio system support the lecturer's presentation, which will be prepared and accessed with ETH World integrating different media and sources.
The audience will have the opportunity to contribute additional material, questions and examples from their own studies. Therefore each desk for two students is equipped with a display embedded in the desktop and an keyboard. These terminals can be substituted by laptops. The lecturer can decide whether to grant open access to the presentation facilities or to have the contributions preselected before they are displayed.

These lecture halls will allow new interactive teaching methods to be established, where examples, references, questions, quotes and other material could be contributed by the lecturer as well as by the student.

Seminar Rooms and Other Lecture Halls.

The smaller seminar rooms do not have to provided terminals for every desk. The lecturer has one terminal to access his presentation and links. Moreover there are plugs (or wireless connections) for every student's laptop. Those will enable them to contribute material.

Wireless networks

Wireless networks represent the next generation of networking because of their usefulness in assisting an emerging mobile workforce in a growing information-orientated society. Wireless local area networks are designed to provide coverage in a small area, such as a building, a hallway, a park, or an office complex by extending or replacing wired LANs. The main attraction is the flexibility and mobility supported by a wireless LAN; bandwith considerations (1-20Mbps) are secondary. Nonetheless for users accustomed to Gigabit networks it can be a noticeable delay.
This opens new opportunities in the field of education. Users with laptops can additionally retrieve information from the net or get references on the lecture they are participating in. Using programs to analyse data in scientific domains can become an integral part of the courses. Another advantage of the WLAN would be to allow the ETH-community access to (assistive technologies) programs free of charge. These programs are platform independent thus allowing also free exchange of data. They run partly on the host and could store the data also on disks in the net, freeing the resources of the laptops. Updates, bug fixes and administration is handled centrally. The fields that are covered through such programs include document production, table calculation, image-processing or mathematical analysis. A field of IT with future, it would also mean that any comparable programs developed by the ETH might have big echo in the Web community.
Potential problems of the WLAN:Unlike cellular networks where a frequency is allocated, users in WLANs have to share frequencies, which may lead to collisions. It is difficult to detect collisions in WLANs because the power levels of signals coming to a mobile user may be different and a station may not detect a potential competitor for the medium.

Privacy and Data Protection

All information about users will only be accessible through personal passwords. By encrypting all personal data the information is not available for unauthorised access. Only a user that holds the password can encrypt and access his/her information.

Implementation plan ETH World

ETH WORLD ELEMENTS

The development of ETH World will be divided in four partly simultaneous developed projects:

- the Contextualizer
- the Bees
- physical and virtual design
- Bee Teamed: the learning environment
-

Every project will be developed by a specific taskforce.
The overall life cycle for the ETH World is co-ordinated by the ETH World team. This team is responsible for the integration of the four projects and makes sure that the projects support to the overall concept of ETH World. The team monitors the seperate projects and organises interproject meetings when neccessary. Each member of the team is also member of a taskforce and responsible for communication between his taskforce and the ETH World team.

RESOURCES

Technological infrastructure

All elements of the landscape are conceived as Cross-Plattform Applications that will run within the popular Internet browsers like Netscape or Internet Explorer on most computer platforms, but also on other interfaces like the Collaborative Lounge Table, the Interactive Door Lables or on handheld and palmtop devices and all other kinds of networked interfaces.

The *Contextualizer* is the main software tool of ETH WORLD. It works like an expanded Internet Browser that is combined with a database to give access to information stored on various internet servers within ETH and the *World Wide Web*.

A system like ETH-World basically takes the existing technologies in consideration. The backbone of the system is the ETH own network (RNETH), which allows fast transmission of data, with the WLAN extending the connectivity to users and apparatus not integrated in the net. The existing ETH-local databases are integrated together with www-local databases into one big database through a meta-database that hides the platform and proprietary details, allowing the user and applications to access data without knowledge of the different underlying structures. For data stored in a multitude of

different formats such as documents, images, statistic tables, etc. data warehouse methods provide well-defined means to retrieve such data. Data mining methods can be used to analyse information patterns, or look for new relationships between data.
The ETH-World takes the existing technological structure into consideration and tries to give it a homogenous appearance. A user is not confronted with the diversified underlying structures, so that he can concentrate on the information seeking without having to understand how and where the information was retrieved.

Physical infrastructure and its implementation
New installations like the lounges can be built up gradually. In the beginning they could use existing infrastructure which could be taken from the computer rooms. Since the architectural set up of those study and work environments is easier accessible and more comfortable people will have no difficulties to get used to working with ETH World.
The more complicated parts of them like the team work environment with the interpersonal computers need research to be realised. They will be installed later on and could be developed in cooperation with industry partner.

Adaptations of the existing infrastructure can easily be installed by connecting them to ETH World. Those interventions will take place immediatedly.

The ETH World Activity Display in the Hauptgebaeude and at the Hoenggerberg could be set up as soon as the virtual ETH World is on line to create as sense and consciousness of what ETH World is and that the whole school takes part in it.
The information terminals which are based on existing technology should work from the start of ETH World to give visitors and newcomers to the ETH orientation and an overview over the endless possibilities within the ETH World.

Minor installations like the door signs could be installed step by step starting with important lecture halls and public institutions. Then the smaller rooms will be equipped.

Human resources
The ETH needs specialists for both the ETH World team and the different taskforces. Specialists in the following area are needed:
- the project manager leads the ETH World team and is in charge of the overall project
- the IT specialist researches and develops the contextualizer and the agents
- the programmer builds ETH World together with the IT specialist
- the designer/architect designs the virtual and physical world
- the didactic and communication specialist is in charge of the learning and communication facilities of ETH World

These five specialists form together with ETH members, the ETH World team and the taskforces. All ETH World members are invited to join the development of the world's leading system.

ETH WORLD TEAM
The overall life cycle for ETH World will be co-ordinated by the ETH World team. This team is responsible for the integration of the four projects and has to make sure that the projects stay true to the overall concept of ETH World. The ETH World team monitors the separate projects and organizes cross-project meetings when necessary. Each member of the team is also member of a taskforce and is responsible for communication between his taskforce and the ETH World team.
To make sure that the team keeps an overview over the entire project they will organize interdisciplinary and international meetings, in which the project is presented and evaluated. Presenting the project to important colleagues will help the team to keep the overview of the project.

LIFE CYCLE PER PROJECT
System development
Initial study
During the initial study the taskforces examines former researchs on similar subjects. Essential research results are taken into account and interesting researchers are contacted for essential discussions. Essential criteria for the main study are formulated. Research borders and system requirements are formulated. At the end of the initial study the project is well described and the relations of the project with ETH World and the rest of the world is clear and logical.

main study

During the main study every detail of the project is thoroughly looked at and planned by the taskforces. Available time, money and people are taken into account and investment decisions are made. Detail studies are defined where needed. At the end of the main study a clear plan for the system realisation is formed, leaving room for the results of the detail studies. This plan will be presented to and evaluated by the ETH World Team.

detail studies
Parts of the project that can not be clearly defined in the main study are researched separately. For every detail study a solution is found which will be integrated in the project planning. The taskforce will include the results in the project planning. The team will evaluate the total project plan.

System realisation
system building
In this stage the system is built and tested by the taskforces according to the plan formulated during the main study. The taskforces will regularly inform the Team of the status of the project. Problems will by solved by the taskforce and the team together.

system integration
After the system has been built all elements are integrated by the taskforce. The team is responsible for the integration of the system with the rest of the ETH World.

data integration
After all systems are built, existing data will be integrated in the system. Not only internet data are retrieved, also other data sources are integrated. In this stage the ETH World team will delegate content responsibility to different people and different sources.

system introduction
After the system is thoroughly tested by all taskforces and the team, it will be introduced to all members of the ETH. This will be a major event with lots of national and international guests.

Usage and further development
After the system introduction all taskforce will monitor the usage of there parts of the system. The team will co-ordinated this monitoring. Minor errors will be quickly restored, other eventual problems will be analyzed in new research projects. System maintenance will be co-ordinated by the ETH World Team. New developments will lead to new projects and new taskforces.