

5	The user side: designing user-friendly & attractive interfaces
5.1	User interfaces: architecture and functionalities
5.1.1	SEUs' side

All the SEU's interfaces are presented and commented on below.

5.1.1.1	Creating, modifying and cancelling a subscription
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To subscribe to the service as an end-user a subscription procedure is required where applicants are asked to type in necessary information (the service can't work without this), and some additional items, useful for statistical purposes and for bettering the service itself. During this phase, SEUs define a personal ID and a Password they will use each time they want to access the service. SEUs can modify their personal data.

User personal data setting (subscription procedure)	
entry	comment
First Name	mandatory
Last name	mandatory
Main institutional affiliation	These items are for statistical purposes, to offer a useful basis to better the service itself.
Your role	
Street address	
Post Code	
City	
Country	
Telephone	
Fax	
E-mail	mandatory
Age	These items are for statistical purposes, to offer a useful basis to better the service itself. Age and sex have no default value.
Choices: 19 – 29 / 30 – 39 / 40 – 49 / 50 – 59 / > 60	
Sex	
Choices: Female – Male	
Other institution 2	
Your Role	
Other institution 3	
Your Role	
Choose a Username	mandatory
Choose a Password	mandatory
Retype the Password	mandatory
Notification periodicity (if new documents are found) choices:once a week – once a day	mandatory:default “once a week”

Personal data can be modified, except for the username.

To cancel a subscription, a link is provided in the “Profile list” page. A verification procedure is entered, to avoid involuntary unsubscription. A direct link to the same verification procedure for unsubscription is provided at the end of each e-mail message issued by the service, thus complying with the strongest opt-out requirements.

Subscription procedures are the same for both subject areas.

5.1.1.2 User profiles setting

Once the subscription phase is finished, it is possible to set one or more user profile(s). User profiles can be modified, added and deleted.

Hereafter both the interfaces are shown for the R&D area and for the pharmaceutical one.

User profile setting (R&D area)	
entry	comment
Classification codes Industry and Technology INDUSTRIAL MANUFACTURE - ELECTRONICS, MICROELECTRONICS INFORMATION PROCESSING, INFORMATION SYSTEMS TELECOMMUNICATIONS - TRANSPORT - AEROSPACE TECHNOLOGY CONSTRUCTION TECHNOLOGY - MATERIALS TECHNOLOGY OTHER TECHNOLOGY Energy NUCLEAR FISSION - NUCLEAR FUSION - FOSSIL FUELS RENEWABLE SOURCES OF ENERGY - ENERGY STORAGE, ENERGY, TRANSPORT - ENERGY SAVING - OTHER ENERGY TOPICS Physical and Exact Sciences METEOROLOGY - EARTH SCIENCES - MATHEMATICS; STATISTICS Biological Sciences MEDICINE, HEALTH - BIOTECHNOLOGY - LIFE SCIENCES Agriculture and Marine Resources and Products AGRICULTURE - FOOD - RESOURCES OF THE SEA, FISHERIES Measurements and Standards MEASUREMENT METHODS - REFERENCE MATERIALS - STANDARDS Protecting Man and his Environment SAFETY - ENVIRONMENTAL PROTECTION - RADIATION PROTECTION WASTE MANAGEMENT - RADIOACTIVE WASTE Social, Education and Economic Concerns SOCIAL ASPECTS - EDUCATION, TRAINING - INFORMATION, MEDIA ECONOMIC ASPECTS - REGIONAL DEVELOPMENT RTD Horizontal Topics POLICIES - LEGISLATION, REGULATIONS - FORECASTING - EVALUATION INNOVATION, TECHNOLOGY TRANSFER - COORDINATION, COOPERATION SCIENTIFIC RESEARCH	According to CORDIS standard
Type of information choices: Borsa di ricerca - Manifestazione - Messa a concorso - News	
Profile name	

User profile setting (Pharmaceutical area)	
entry	comment
Pathological areas choices: Bacterial Infections and Mycoses – Virus Diseases – Parasitic Diseases – Neoplasms Musculoskeletal Diseases – Digestive System Diseases – Stomatognathic Diseases Respiratory Tract Diseases – Otorhinolaryngologic Diseases – Nervous System Diseases Eye Diseases – Urologic and Male Genital Diseases – Female Genital Diseases and Pregnancy Complications – Cardiovascular Diseases – Hemic and Lymphatic Diseases Neonatal Diseases and Abnormalities – Skin and Connective Tissue Diseases Nutritional and Metabolic Diseases – Endocrine Diseases – Immunologic Diseases Injuries, Poisonings, and Occupational Diseases – Animal Diseases Symptoms and General Pathology	According to MeSH standard
Therapeutic agents choices: Inorganic Chemicals – Organic Chemicals – Heterocyclic Compounds Polycyclic Hydrocarbons – Environmental Pollutants, Noxae, and Pesticides Hormones, Hormone Substitutes, and Hormone Antagonists – Reproductive Control Agents Enzymes, Coenzymes, and Enzyme Inhibitors – Carbohydrates and Hypoglycemic Agents Lipids and Antilipemic Agents – Growth Substances, Pigments, and Vitamins Amino Acids, Peptides, and Proteins – Nucleic Acids, Nucleotides, and Nucleosides Neurotransmitters and Neurotransmitter Agents – Central Nervous System Agents Peripheral Nervous System Agents – Anti-Inflammatory Agents, Antirheumatic Agents, and Inflammation Mediators – Cardiovascular Agents – Hematologic, Gastrointestinal, and Renal Agents – Anti-Infective Agents – Anti-Allergic and Respiratory System Agents Antineoplastic and Immunosuppressive Agents – Dermatologic Agents Immunologic and Biological Factors – Biomedical and Dental Materials Specialty Chemicals and Products	
Type of information choices: [product information:] clinical studies concerning products on the way to be registered information on products when they are released – product withdrawal – monitoring studies concerning already marketed products [end of product information] – pathology-related studies new application of already existent principles – conferences – companies' business information	This menu has been developed after interviews with doctors and pharmacists
Profile name	

User profiles can be modified and deleted (again, through a double confirmation procedure).

5.1.1.3 Profiles' and documents' list

When new documents are inserted, according to a given user profile, they are made available through a personal page. SEUs can see how many new documents are available for each profile, their lists, and the summary for each item, together with the logo of the AIP and document publication date. From the summary page it is possible to go straight to the page which publishes the complete document (if available) or to AIP's home page (if available).

List of user profiles	
shown item / choice	comment
Welcome to SwissCast, [first name + last name] (Username:[username])	
Profile Name & Document Access	Profile name is hyperlinked to its document list
New Documents	Number of new documents which match the user profile
Total Documents	
Seen last time at	
See/modify profile definition	Go to the profile setting procedure
Delete	Double confirmed deleting procedure

Document list for each user profile	
shown item / choice	comment
Document list for profile [profile name] Documents [number] [number] out of [number] documents	
Document title	Hyperlinked with that document's summary page
Source	Name of AIP
Publication date	
Perform action on selected documents choices: keep - delete	It is possible to check each document and to delete / keep the selected ones. "Delete"checked documents are immediately removed from the list.Due to its push nature, SwissCast removes each document item from the list after two weeks, provided that the profile was visited and the document was not checked as "keep". Some additional features are foreseen,in order to offer SEUs more document management options.

SEUs get an e-mail notification – once or twice a week, as they indicated – of new items matching their profiles.

5.1.1.4 Information item page

Each information item shows the following elements:

Information item page	
shown item / choice	comment
Publication date:	publication date
[LOGO]	provider logo, hyperlinked to the provider home page
Author:	author name
[TITLE]	title
[ABSTRACT]	abstract
Document reference:	if available, hyperlinked to the page where the original document is hosted.

Subscription verification message

Subject:SwissCast verification message

—+— SwissCast Push System - [SUBJECT AREA] —+—

Welcome to the SwissCast service,

\$surname \$firstname!

To enable your subscription, please REPLY to this message without adding any text.
(If you didn't perform the SwissCast subscription procedure, just ignore this message).

the SwissCast team

© SwissCast 1999

Subscription confirmation message

Subject:SwissCast welcomes you

—+— SwissCast Push System - [SUBJECT AREA] —+—

Welcome to the SwissCast service,

\$surname \$firstname!

YOUR SUBSCRIPTION IS ON.

You will get e-mail notifications when new relevant documents match your profile.

Thank you and see you soon.

the SwissCast team

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Your User-id is:\$suid

Your password is: \$pw

To see your profile(s) list:

[illegible]

Please, save this message for future reference.

© SwissCast 1999

New information items notification message

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Subject: SwissCast brings to you new relevant documents

Dear \$surname \$firstname,

To see all the documents and edit your profile(s):

Profile:PROFILE NAME

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Documents:
 —> DOCUMENT1
 —> DOCUMENT2
 —> DOCUMENT...

SwissCast messages are sent by permission. To unsubscribe: [\[hyperlink to the subscription procedure\]](#)

S/he has also access — for maintenance activities and statistical purposes — to all the other DB. A few tools will be provided to help IE in doing so.

5.2 | User interfaces: graphic solutions and visual communication

5.2.1 | Visual communication and graphic solutions

The main challenge in building a graphic user interface is to create an environment with a strong and effective visual presence, not to disturb but to enhance the functionality and usability of the service. The interface is a tool that helps the user to interact with the machine and at the same time a tool that allows him to construct a relation with the content.

5.2.2 | 4.2.2 Defining identity (visual identity)

The first step is to give the SwissCast service a visual identity. By visual identity we understand not only a logo or a trademark, but a more complete and complex system of communication.

The logotype (or trademark) is usually designed for a specific product (object): in the case of SwissCast the product is a service to be used for searching in a more precise and effective way than a normal search service. For this reason the user recognises SwissCast using the graphical user interface, and not just looking at a mark.

Our approach to the project was to create a design with a strong visual impact more than just designing a logotype. The interface has the role of creating a relation between the user and the machine and to help him in establishing a kind of familiarity with it.

5.2.3 | The context and the languages

In a context like the Internet, usually confused and chaotic, this kind of relation is hard to establish. The tools in the hands of the designer are dependent on the SEU's capability to customise their software (example: page format, fonts, hiding pictures, colour control...). In traditional media (and graphic designers have only had this background until now), designers control almost every step of the communication (formats, fonts, colours, papers - the feeling of touch...).

5.2.4 | The structure

The structure of SwissCast is supposed to be extended to many more areas of interest. At the moment we have defined two research areas (R&D, Pharmaceutical area). Because of that SwissCast is not only "representing" itself, but it also has to show other characteristics, other languages. This is an important constraint for defining a visual identity. We have to design an interface that communicates SwissCast but at the same time we have to recognise different "channels" with specific characteristics and different audiences. In some way we can compare this problem with the problem of corporate identity, where a unique and strong solution is articulated and varied without losing the recognisability of a unique concept.

5.2.3 | The symbol

The first decision was to design a logotype-trademark for SwissCast. This sign must represent and put together two different meanings: the regional origin (Switzerland) and the functionality of a push system. If the national identification is easy to find (flag) and easy to recognise, representing a push system creates some problems. This sign must have the following meaning: continuous search and transmission.

The elements chosen are the following:



The combination between these signs give the following result.



5.2.6 | The interface

The structures have been defined with those who are responsible for both the content and the technical part. The interface is composed by three fields, three different points of visual interest with different content. A title bar on the top of the window (with the logotype integrated in a grid system), a control bar on the left and a field on the right where the result of the researches and the profiles are shown.



5.2.7 | Title bar and symbol integration

The symbol described above is here integrated inside a grid system generated by the squares of the Swiss flag. In the lower part of the title bar some squares are used to give a visual reference to the different channels with the use of different colours.

At the moment there are just two “channels” but the interface anticipates the possibility of a growth of SwissCast with many other “channels”(see figure 1 in color pages).

All the elements in the title bar are designed for a 16 colour palette in order to reduce the size in KBytes (see figure 2 in color pages) and to enhance its portability.



5.2.8 | Control bar and colour

The grid system used in the title bar also gives the width of the control bar down on the left. This field acquires the colour of the selected “channel”. The two parts are visually connected and they look like a single element, creating a kind of frame for the profiles and results field. (see figure 3 in color pages)

We can also put a picture in the control bar if necessary (for example in the pharmaceutical area). (see figure 4 in color pages)

These variations of colours and pictures offer a wide range of possibilities for implementing more channels in the future without losing the recognisability of SwissCast. (see figure 5 in color pages)

5.2.9 | Profile and results pages

This part of the interface is poor in graphics elements. The content only consists of text and we decided to work only with background colours generated by the html code (hexadecimal colours) to speed up the process of downloading.

The colours used are: grey for the general background and for the fields with interactions (Links), and the same colour of the control bar for title fields and auxiliary information. (see figure 6 in color pages)

Once defined a colour for the control bar, for a better result in the push service we decided to redesign the web site of Servizio Ricerca. We divided the information items into two different frames (FRAMESET), a “header” with navigation tools and a “body” with the content that we have to show in SwissCast.

The graphical structure is a variation of the visual identity of Università della Svizzera Italiana (see figure 7 in color pages). We used the same structure to build up a system for navigating through the web site and to indicate where the information is located.

The pharmaceutical industry realised at a very early stage the importance of aesthetics in product information. They had the need to balance information and visual quality.

Their audience was not the consumer, but a middleman, a physician or a pharmacist.

This situation had two significant implications:

- information based on scientific fact had to be provided
- the material had to satisfy the aesthetics standard of a cultured public.

For this reason pharmaceutical companies employed artists who were able to summarise complex scientific information in clear and convincing images.

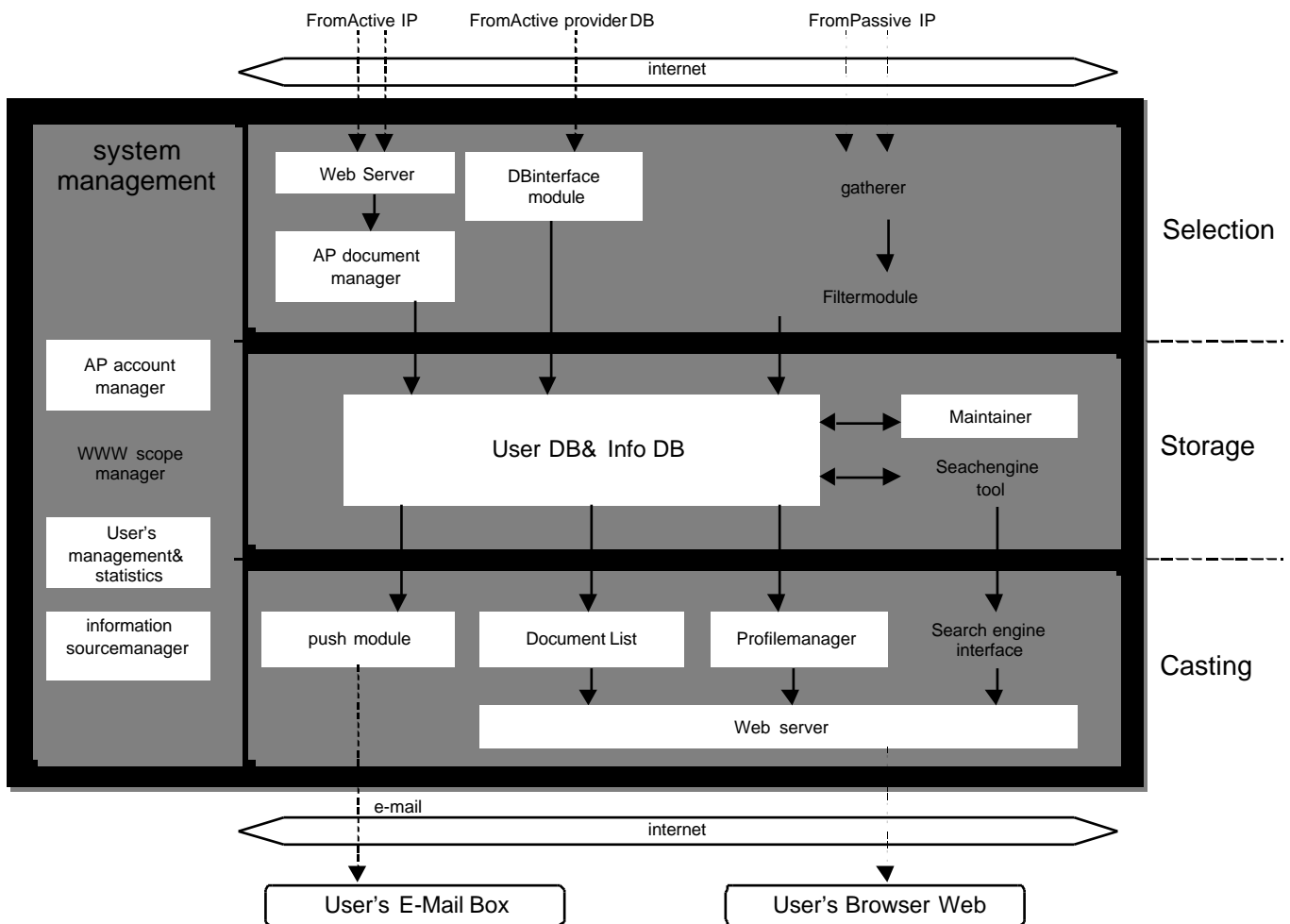
In this respect the pharmaceutical industry can be regarded as a pioneer and a patron of the Applied Arts.

Our choice of representing a human body, or a detail of it, is guided by the purpose of introducing a sign that allows the user to immediately identify a communication where “man” is in the centre of our aim: a ‘humanistic’ approach that is suggested by the use of an old scientific illustration (18th century). (see figure 8 in color pages)

In this image we found the answer to the two communication problems we had: a scientific approach and an aesthetic sensibility.

In this chapter we present the technical solutions adopted for the realisation of the SwissCast push service; as it will be clear in the following pages, technical work in the SwissCast project consisted more in a clever integration and adaptation of existing technologies and tools than in developing new applications. A specific technical report will be produced at the end of the project, giving complete technical documentation of the programming activities.

The basis for this work was a review of existing push technologies, done during Spring 1998 (see the 1st project interim report), and the testing of the push system developed by Eurospider AG on the basis of the Eurospider search engine. While this test was very useful for gaining insight on the technical functioning of a push service, we found that our approach to information management – i.e., full indexing of the information by the information editor and by the active information providers – leaves room for major simplifications at the level of the push module, because it is no longer necessary to develop it on the basis of a full text search engine. At the same time, the development of a series of simple tools for information gathering (from the WWW) and indexing is another distinguishing feature of the system.



The above figure shows the architecture of SwissCast partitioned in logical modules. The modules in the figure are “logical” because one or more software modules can correspond to each module. Notice also that the modules in grey are not yet implemented (in April 99).

The SwissCast system is based on a centralised db, which acts as a container either for information (that we also call ‘documents’) and user’s profiles and data. Information is inserted in the system from AIPs through the AP document manager module, AIPs access this module via the Internet using a common web browser and filling-in information through forms. An account (username and password) is assigned to AIPs to enable them to enter the AP document manager. The IE, through the form AP account manager, manages the accounts of the AIPs and checks the quality and the goodness of the inserted documents.

A module has been inserted in the system which is dedicated to interfacing SwissCast directly with one or more db that belong to AIPs: db interface module, this module has been added since some of them (for instance, for the pharmaceutical service, it is the case of ActaMed) have already structured and organised corporate db, where information they want to share with SwissCast is loaded. In any case, those db are accessible via the Internet. This module can automatically extract most recent information from AIPs' db and download it locally on the SwissCast db.

A form called Gatherer will be used by the IE to monitor a series of websites (PIPs) and to receive the last updates automatically. Through the module Filter then the IE can discard all the useless information items and insert in the document db only relevant information. Moreover, through the module www scope manager, the IE can set the list of the pages HTML or whole web sites, to be monitored by the gatherer.

Users, instead, will access SwissCast using a common web browser, through the modules profile manager and document list; they will create their own profiles through the forms available in profile manager, and they can see relevant information through the module document list.

Besides, the system will notify the users via e-mail (through the module push module) if there are new information items. Moreover, through the modules search engine tool and search engine interface, the users can formulate some full text searches on documents contained in the db and/or elsewhere, on selected dbs or websites. The IE can manage users' accounts and profiles, as well as generate all the opportune statistics, through the module user's management & statistics.

We will see the details of every module in the following paragraphs.

6.1 Module description

Most of the SwissCast system has been developed using current freeware software tools, adapted to our needs and integrated using CGI programming. Modules were implemented in Perl 5 programming language, (in fact, Perl provides the best support for CGI programming, being fast, concise and simple).

Here we give a description of the single logical modules involved in the architecture of the SwissCast system.

6.1.1 AP Document Manager

This module of the system is to be used by the active providers to manage their own documents. This module could be accessed by the AIPs using a browser through an account assigned from the IE. It includes the following tasks:

- create a new document
- modify an already existing document
- cancel a document
- see the output of the documents

For every document to be inserted into the db, the provider must specify:

- an URL address to refer to for further references about the subject
- the date in which the document must be published to users
- the date in which the document must no longer be visible to the users of the system
- the date in which the document must be definitively deleted from the db
- the Author
- a short abstract of the document
- the type of document (selected between a given set)
- the list of the subject themes according to which the document has to be classified
- the title of the document
- the language the document was written in

6.1.2 DB Interface module

This is the module that is involved to extract information from Active provider's dbs. The module extracts all the necessary information to be used by SwissCast (Title, subject, etc.) inserted on the provider's db during the last period (generally, if the module is activated with daily schedule, it extracts information inserted in the db in the previous day). Information extracted by this module will remain inserted in SwissCast db for a fixed period of 30 days, afterwards they will be automatically deleted.

6.1.3 User DB & Info DB

We have used the MySQL db server from T.c.X.DataKonsult AB. The choice of this db server is due to its speed, robustness and facility of use; moreover MySQL is free for universities and research centres. However the software that interacts with the db uses a specific standard interface of Perl: DBI⁶; this provides a standard interface for most of the relational db system in commerce (like Microsoft ODBC on Windows programs). In the future it will be possible to replace MySQL with other db servers (for instance Oracle DBMS) without having to modify the software.

Documents are stored in the document db (InfoDB) and remain there for a period determinate by the IE. In every case, documents assigned to a given profile remain visible in such profile for a fixed period of 15 days, unless the SEU marks the information item as "keep"; in such case the information remains visible for a profile until this is eliminated from InfoDB in a permanent manner (i.e. the document has reached the expiration date or the provider has deleted it). In any case, the system does not cancel any document until SEUs have accessed their document list at least once.

6.1.4 Maintainer

This is the module that is involved in performing some routine operations of routine on the db, among which:

- checking the consistence of the db, in particular the constraints for referential integrity⁷, since the db MySQL is not able to check it. Even if this functionality is not strictly necessary, it is opportune to implement it in the system test phase to check possible bugs
- delete the documents that have reached the expiration date indicated by the AIP
- delete, in every profile, the documents assigned to the profile that have reached the 30 days of permanence (except when the users have not yet seen the documents of the profile or documents labelled as "keep").

6.1.5 Push Module

The push module checks user's profiles periodically and sends a notification e-mail to SEUs. This module consists in a demon software activated with a daily schedule time (at night). The tasks of this module are:

- sending only one e-mail message in order to notify more profiles belonging to the same SEU
- Each notification message must include:
 - for each profile the title of each new document (i.e. documents matched against the profile whose insertion timestamp is subsequent to the timestamp of the last time in which SEU have seen their documents)
 - the URL link to the list of SEUs profiles.
- It will be possible to send a mail of notification when there are no new documents, after a period of inactivity, whose periodicity must be established by the administrator (not yet implemented)
- It will be possible for the user to disable the notification messages (not yet implemented) .

6 www.hermetica.com/tecnologia/perl/DBI/index.html

7 The Referential Integrity constraints assert that for each foreign key in one table there must be a referenced primary key in the referenced table.

6.1.6 | Document list

This is the most critical module from the point of view of the SEU. SEUs log to this form through a common web browser, to look up the list of the documents assigned to their profiles. Every user has to log into the profile manager through an account (username, password) chosen during a preliminary phase of subscription to the system.

This module offers:

- possibility for the SEU to consult the list of the documents in order of date
- display the total number of documents
- possibility for the SEU to delete more documents at a time
- possibility for the SEU to mark one or more documents as “keep”. The documents with “keep” flag won’t be automatically deleted after the maximum period of permanence (30 days) apart from documents which reached their expiration date, which are automatically removed from the document db (documents can’t be deleted from a profile, unless SEUs have accessed their lists at least once)
- possibility of displaying of each document, near the title, an abbreviation mark which identifies the information provider.

6.1.7 | Profile manager

This is the module used by SEUs to manage their own profiles. They will log-in through an account (username, password) assigned during a preliminary phase of submission.

The tasks of this module are:

- possibility for the SEU to create, to cancel, to modify the definition of the profiles
- display the list of the existing profiles, and for every profile show the total number of documents assigned to it and the number of new documents
- display, for every profile, the list of the documents
- possibility for the SEU to cancel one or more documents assigned to a profile
- possibility for the SEU to mark one or more documents assigned to a profile as “keep”, so they will not be deleted automatically after the fixed period of maximum permanence (currently fixed to 30 days) .

6.1.8 | System management tool: AP Account manager

This module will be used by the IE to manage AIPs’ accounts. The IE performs all the administrative tasks through a web browser, and after a password protected log-in phase.

This module can, among other things:

- add a new provider
- modify the data of a provider
- enable/disable the account of a provider
- delete a provider
- delete all the documents published by a provider
- see the number and the list of the published documents.

6.1.9 | System management tool: WWW Scope manager

This is the module that will be used by the IE to manage the scope of the search for the gatherer module.

This module can (or will be able to):

- see the list of the existing links
- add a link (URL, N. of links to follow, max. level of the links to follow, include list, exclude list)
- modify a link
- delete a link .

6.1.10 | System management tool: User's management & statistics

With this module it is possible to manage user's data and profiles, as well as to produce some statistics.

This module can:

- show user's list
- send an e-mail to all subscribed SEUs and AIPs
- show for each SEU:
 - personal data
 - profile list
 - profile definition and document list
 - date and time of last access to SwissCast
 - date and time of last received notification e-mail.

6.1.11 | System management tool: information source manager

This module is used by the IE to manage the PIPs' list (used as information sources). The IE manages PIPs' list through a web browser. This module can:

- add a new source
- modify the data of a source
- cancel a source .

6.1.12 | Server Web

We use Apache (<http://www.apache.org>) as web server; this web server is used by over 50% of the Unix servers in the world (and almost all the servers in universities), because it is reliable, fast, and freeware.

In order to facilitate the complete separation between the pharmaceutical application and that for R&D, two separate web servers have been installed, which run on different ports, namely: 8001, for the pharmaceutical area, and 8002 for the R&D area.

6.1.13 | Log files

SwissCast system includes a mechanism of log files; they record the single actions that are effected from the SEUs or from the AIPs in the system. For every recorded action there are also reports of the date and time of the access and the IP address of the computer from which the SEU or the AIP is connected.

Actions recorded by log files are:

- AIPs:
 - visualisation of the list of the documents
 - creation, modification and deletion of a document
- SEUs:
 - visualisation the list of the profiles
 - look up the documents belonging to a profile
 - creation, modification and deletion of a profile
- errors of consistence found by the maintainer module
- the actions performed by the push module
- details of the documents deleted by the maintainer module
- details of the operations performed by the db interfacing module.

6.2 Conceptual schema of db

This conceptual model provides a precise description of the types of data that we want to involve and the relationships between them. This paragraph offers a description of the conceptual model of the db, represented through the entity relationship model (E-R model); see figure below.

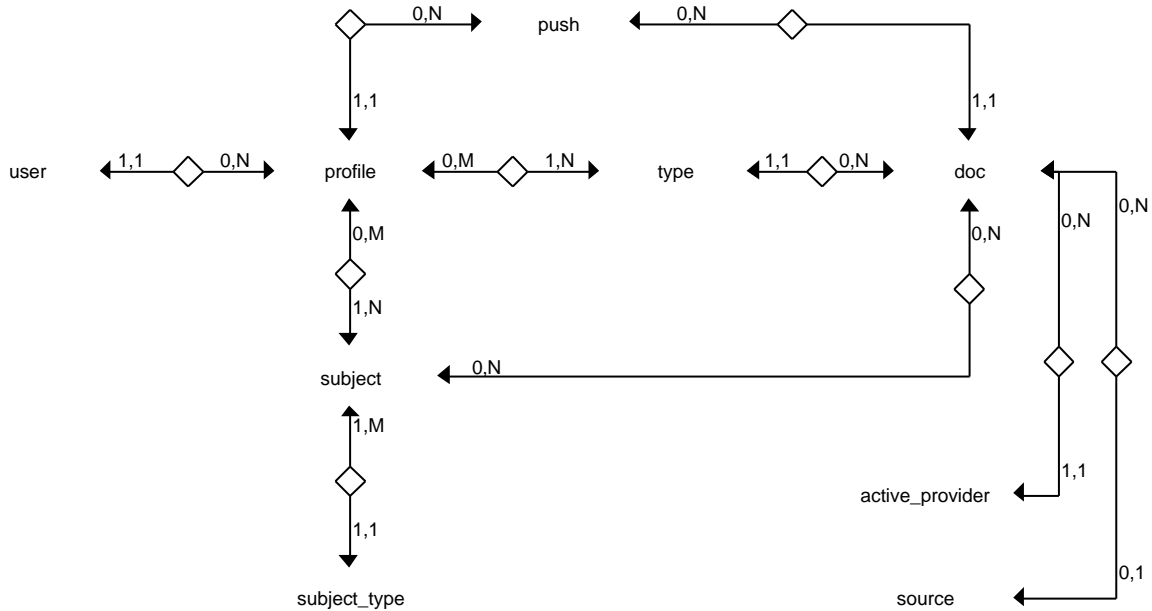


Figure :E-R schema of SwissCast db

The involved entities are described as follows.

Entity user contains personal data of the users of the system, as well as some necessary information used internally by the system.

Entity profile contains all the necessary data to describe the detail of a profile.

Entity doc contains documents published by an AIP.

Entity push contains the references to documents assigned to profiles.

Entity type contains list of document type.

Entity subject contains the list of the subjects that can be associated to the documents.

Entity subject_type contains the list of the types in which the subjects are grouped by.

Entity active_provider contains the list of active providers, while entity source contains the list of passive providers.

6.3 Future developments

This section describes the modules whose implementation is foreseen.

6.3.1 Gatherer

This module is a software package for gathering web documents and collecting them in a cache. It will be used a robot for harvesting web resources, and new information will be fetched and collected in a local db. The harvested items will be collected for further processing by the module filter (see below). A good candidate for its implementation is Combine, a gatherer developed as a part of the Development of a European Service for Information on Research and Education (DESIRE <http://www.desire.org>) project, which is funded by the European Commission within Telematics for Science Program.

6.3.2 | Filter module

This module will be a tool for the IE. It supports the editing and the insertion of new documents having the web pages found by the gatherer module at its disposal.

Some tasks of this module are:

- see the list of the new html pages fetched by the gatherer, grouped by provider, date, etc.
- delete a page from the list of fetched pages
- open a html document in a browser's frame and, through the copy and paste utility, edit a new SwissCast document and publish it
- the IE to receive daily an e-mail which notifies the number of new pages found from the gatherer and their URL.

6.3.3 | Search Engine tool & interface

This module will contain a search engine, which is able to extract all the documents of the db, to index them and to make them available through full-text query to the users. Moreover it will be necessary to adapt or to build a new user interface for this module.

7 Assessing relevance & usability of push services

Being an information brokerage service, SwissCast is supposed to be judged by those who are engaged in information providing & receiving, as well as by the person who does the brokering activity.

As for every brokering activity, the broker stands for the provider in front of the user (and vice-versa), because of that, and only for the purpose of this validation process, the broker will also be considered as a reliable informant on what the providers want to get from the service. SwissCast must offer to these three parties (none of them excluded) services, features and tools in order to fulfil their own role.

7.1 What to test

System usability is a big issue for whose assessment many empirical and theoretical strategies are proposed. In what follows is sketched the test design: as task oriented and empirical as possible.⁹

7.1.1 IE' side

The head of the R&D University Office, dr. Benedetto Lepori, who is the IE, has been involved since the very kick off of the research project, in order to test and verify the system compliance with his needs, and with those of the information providers. This close relationship helped to design and refine the system architecture keeping those requirements in mind.

A formal interview with the IE will be realized at the end of the test phase with SEUs. A further test activity – under consideration – is that of having another person, not previously involved in the project, acting for a given period as the service IE (in this case, s/he must have a similar known-how to that of the IE).

A similar testing path is foreseen for the pharmaceutical area.

7.1.2 AIP's side

AIPs' satisfaction must be taken into consideration as well. Service accomplishment will be tested through interviews, and a careful analysis of their system sessions.

For both IE and AIPs tools will be provided in order to help them have and give feedback, as well as in order to be able to analyse their activities impact onto the SEUs (mainly statistical features).

8 Cf., for instance, <http://www.useit.com>; Garzotto F., Matera M. A Systematic Method for Hypermedia Usability Inspection. «New Review of Hypermedia and Multimedia», Taylor Graham Publisher, Vol. 3, 1997; Garzotto F., Matera M., Paolini P. A Framework for Hypermedia Design and Usability Evaluation. In Designing Effective and Usable Multimedia Systems (selected papers from the IFIP 13.2 Working Conference - Stuttgart - Germany, Sept. 1998), P. Jonhson, A. Sutcliffe, J. Ziegler (eds.), Chapman & Hall publisher.

7.1.3 | Users' side

Most of the research testing activities are to be done in order to test SEUS satisfaction.

In particular, the following service features need to undergo a severe test:

1. Customisation features
User profile, details, relevance, service's own layout: e-mail messages and user interface, readability, friendliness, navigability, platform & software independence, GUI identity
2. Professional relevance
Comparison with previous used tools, in particular with info-pull services, success stories, business process reengineering
3. Provided info
Languages, readability, style, usability (with SUE: Structured Usability Evaluation)
4. Effectiveness
Service's Unique Selling Point / core business, side effects / peripheral gains or disadvantages
5. Relevance Evaluation
Relevance: only what is required, according to the user profile, completeness: everything that is required, according to the user profile. This last item will need a careful analysis and the development of ad hoc testing strategies
6. Service's info
Main means of providing info / assistance, SwissCast's website, e-mail service, phone assistance, feedback, others
7. Timing & frequency
Messages' frequency, info accessibility.

The SwissCast service will undergo the following test phase (the first two were already experienced when testing the first version of the system, which implemented the Eurospider search and push engine).

7.2 | How to test it

Testing activities are based on both service use analysis and interviews. For what concerns SEUs, they will be organised according to the following three phases (anyway being aware that the service nature itself asks for a continuous testing and refining, in order to better fulfil its task).

7.2.1 | First inspection

Once the software is mounted, the system has to undergo an in-house inspection phase. All the SwissCast researchers try it in order to fix the main bugs and to optimise its performance.

The pre-test phase involves a few people, all computer (and Internet) experts or at least good users, who volunteer after having received an e-mail request. They receive a short document with the pre-test phase main guidelines, and have a twenty minute briefing with a SwissCast researcher, who presents the service, its functioning and the purpose of the testing activities.

They are asked to subscribe to the service, set at least one user profile, and monitor it.

A very simple feedback tool is to be offered, consisting of a form to be completed on-line, when accessing the service itself.

After at about five weeks all of them are interviewed (for about 45 minutes each) on their impressions and suggestions. The interviewer tries not to be directive at all, but to follow the interviewees' own way of representing their experience.

Outputs of this phase are mainly qualitative, namely:

- a list of things to be considered, altered, or implemented
- a questionnaire, which tries to represent and systematise what the interviewees said or implied in their interactions. This questionnaire — in two versions, a complete one, and a shorter one — is to be used in the first test phase
- activities done by the development equipe in order to fix bugs and to optimise the service.

Once those activities are done, the service should undergo the test phase.

An e-mail is sent to a broader sample group, containing:

- a short presentation of the service
- instructions on how to access it
- a call for people who could try it and fill-in the questionnaire after eight weeks. It should be made clear that 1) it is not necessary to volunteer in order to try the service, and that 2) volunteers can choose which questionnaire version to answer.

During this phase only ordinary service maintenance activities are done.

A separate monitoring activity of the system log is intended to find out how many people try the service, and their use of it in terms of frequency of accesses and number of defined user profiles.

Short questionnaires are completed (some by interviews, and others via an electronic form), as well as complete questionnaires (again: some by interviews, and some via an electronic form).

Expected results of this phase are:

- questionnaires filled-in
- some first information on service users' dropping
- a broader and bigger system working
- service refining activities
- a few minor refining activities done on the questionnaires themselves, in order to have their final version available for the second test phase.

At the end of the service refining activities, the service will start its open running.

This test phase can be followed-up by similar ones.