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Delivering Relevant Information to Interested Users

General philosophy,
system architecture & technical realisation
of the SwissCast push service

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The SwissCast Project aims at the design and implementation of Web Casting communication channels, including information about content and human interfaces, addressed to the needs of specific Swiss market segments.

The whole casting system is realised by using Internet Protocol (IP) technologies,in order to provide the general and interoperable platform required for end-terminals compatibility, irrespective of channel types and quality available to users. By focusing on IP based structures, information can indeed be delivered regardless of the access technology (telephone lines, coaxial cables, satellites, wireless connections, etc.) and irrespective of the audio-video information coding technology (MPEG, streaming videos,etc.).The resulting system meets the objective of offering services with scalable quality according to the various users' desktop facilities and access media.Moreover, with this approach,a great degree of attention is given to textual and graphic information in addition to audio and video information,thus opening a flexible experimentation on a large variety of multimedia information mixes.

The focus of the project is on the identification of communities of homogeneous users for whom the casting service can be tailored according to their elicited interests, needs and profiles.The users constitute indeed an integral part of the project team, by assuming a direct role in specifying the service features,and in testing and validating the Project results.

Two communities of interest are currently involved in SwissCast,namely R&D people (researchers,professors,industry managers,…) and people dealing with pharmaceutical information (doctors,pharmacists,drug vendors,...); both of them are mainly located in the Ticino territory.

At this stage of the project, searching, filtering and editing of information, to be delivered to users via e-mail and pushed Web pages, is performed by using 'static'(or updated on demand) user profiles.

The project target is to explore measurements on the 'performance'of this kind of information delivery (Web casting), by evaluating data 'relevance'in relation to the defined user profile. To implement a 'stable ' and controllable prototype, the use of static profiles is mandatory in the learning phase. We need to test and evaluate the system behaviour in the processes of information 'search-filter-edit-deliver', by appropriate 'measurements'in a 'live'environment.

At a later stage 'dynamic' (i.e., based on a feedback control mechanism) user profiles can be added to the system,in order to obtain an improved information casting which could be automatically personalised according to the statistical behaviour of the user in his actual handling of delivered data.

Research on human behaviour in information gathering processes is a genuine mission of the Faculty of Communication Sciences at the Università della Svizzera Italiana. SwissCast is and will indeed be an appropriate to start building a true interdisciplinary research team, as is needed today to foster the testing ground development of effective networked information systems.

Prof. Maurizio Decina,Scientific Director the of Swisscast Project

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1 Introduction

This report presents the work developed by the SwissCast project from October 1997 to April 1999 in the field of the electronic information systems and push services;it focuses on the following main issues:

1. the general concepts at the base of the SwissCast push service and its technical realisation (part I of the report);
2. the realisation of the specific applications in two fields, i.e. that of research (R&D) information and of medical and pharmaceutical information (part II and III of the report);
3. the status of the project and the planning for the second project year (till Spring 2000).

1.1 General outline & project history

The SwissCast project was proposed to the Swiss National Science Foundation (SNSF) in Spring 1997 by the Faculty of Communication Sciences of the University of Ticino (USI-com), by the Department of Applied Arts of the Fachochschule of Ticino (SUPSI-DAA) and by the company Eurospider AG, a spin-off company of the Swiss Federal Institute of Technology in Zurich, to realise and to assess push systems in the Swiss context and for different application domains (see the project proposal).After being approved by the SNSF the project started in Autumn 1997.

The system architecture as it is presented in this report is built upon an analysis of existing push technologies and services and on a careful analysis of the informational structure and needs for the two fields of R&D information and of pharmaceutical information (see the 1st Project Interim Report, June 1998).

On the basis of this information, a first version of the push service was installed in September 1998 for the R&D information area at the USI in close cooperation with the R&D information office of the USI (Servizio ricerca USI/SUPSI);this test version allowed the SwissCast team to gather experience on the function of the system and to test the interplay of different modules; moreover a first testing phase with 6 researchers was conducted during November and December 1998;at the same time extensive testing of the system was done by the SwissCast team and by the Head of the R&D Information office (see chapter ⋆).

This experience gave the research team a better understanding of the functioning of a push service, not only at a technical level, but above all at the level of the management of the information flows and of the user behaviour, requiring an important redesign of the system, wich led to major changes in the technical realisation of the push module (see chapter ⋆ for more details).

At the same time, the SwissCast team developed contacts with pharmaceutical companies and with a major provider of pharmaceutical information in Switzerland;with the collaboration of the actors it was possible to define the informational structure for this domain and to plan a module that allows the information providers to quickly upload information into the push system.

Thus,while we will present in this report the general service architecture, as it is now organised,the reader has to keep in mind that the system design was done in parallel with the realisation of the two applications in the R&D and in the pharmaceutical domain and that the experiences gained from the two fields are now embedded in the system architecture. This parallel development was also very useful because different needs and problems emerged; in fact,the final system architecture derives from the integration of insights and modules from the two application fields.

In the original project plan, it was foreseen to develop also a push service in the tourism area, due to the fact that tourism has a very complex informational structure and thus could give room to very interesting research activities on communication and integration of electronic tools. However, during the first phase of the project,it appeared necessary to concentrate on the development of a fully functioning prototype and thus it was preferred to give priority to the R&D and pharmaceutical areas, where the content structure was better known.

Tourism could be perhaps developed as an application area in the follow-up of the SwissCast project..

1.2 Organisation & main activities of the SwissCast project

The main activities in the SwissCast project can be divided as follows (see the figure):

1. The development of a complete **push system,** based on the integration of different existing modules – e.g., standard databases, Web server, Web gatherer – into a common framework, based on general reflections on the concept of push service and the organisation of information flows.This work has been started in June 1998 and has been ended in April 1999 with the release of a full functioning version and is presented in part I of this report.

2. The development of a service which delivers information on **research programmes** to scientists in the Italian-speaking part of Switzerland. This service integrates the push system into an information platform that also offers basic information on research on a conventional Web site, search facilities and a collection of links to other information services in the field. Work in this field started in January 1998; the full service, including the push system, has been operational since the end of April 1999 (part II of the report).

3. The development of a pharmaceutical information service, which delivers new information from pharmaceutical companies – e.g., on new pharmaceutical products –, as well as information on new scientific literature in the health field. Work for this application started in Spring 1998 and it consisted mainly in analysing the information market and user needs, developing a classification framework for pharmaceutical information and in motivating the service partners (information providers); the service has been put online since April 1999 (see part III of the report) and will be further developed into a fully commercial application.

The following table summarises the competencies needed and the roles of the different project partners:

Domain	Activity	Partner
	Project responsible	Maurizio Decina, USI-com
	Co-Responsibles	Eddo Rigotti, USI-com Fiorenzo Scaroni, USI-com and SUPSI
General project coordination & management		Neviano Dal Degan, USI-com
Development of SwissCast push service	Coordination of the activity	Benedetto Lepori, USI-com USI & Servizio ricerca USI/SUPSI
	Information theory & design of the service	Lorenzo Cantoni, USI-com
	Design of the interfaces	Paolo Jannuzzi, SUPSI-DAA
	Technical implementation of the service	Riccardo Mazza, USI-com
	Technical consulting in the field of push & information retrieval	Christoph Baumgarten, Eurospider AG, Zürich
Application in the research information area	Design of the service, information retrieval & classification	Benedetto Lepori, USI-com & Servizio ricerca USI/SUPSI
	Technical implementation of the service	Riccardo Mazza, USI-com Giovanni Mombelli, USI-com
	Service management and promotion	Servizio ricerca USI/SUPSI
Application in the pharmaceutical area	Design of the service, information retrieval & classification	Lorenzo Cantoni, USI-com
	Technical implementation of the service	Riccardo Mazza, USI-com
	Contact with information providers and project partners; service promotion	Lorenzo Cantoni, USI-com
	Project partners	ACTAMED; Pfizer; IBSA; Künkle
Technical support	Server & network management	Mario Gay, Servizi informatici USI/SUPSI

1.3 Project plan for 1999 and future developments

The Swisscast project will end in march 2000;the work of the project time during this time will be concentrated in the following main areas:

- technical development:further developement and refining of the Swisscast push system, including the development of some missing modules (e.g.,gatherer module and integration of a search engine);
- R&D area: promotion and running of the information&push service in this area;detailed assessment of user's behaviour and satisfaction; enlargment of the information scope of the service and refining on the the basis of assessment's results;
- Pharmaceutical area: development,together with the project partners,of a commercial service which could be run after the end of the project;test phase of the existing prototipe;
- Reporting and promotion:promotion of the Swisscast service;publication of papers & preparation of the final project report.

1.3.1 Development of further research

The area of the «customized information environments»,including web and push services,has been designed as one of the main research areas for the Faculty of communication sciences at the USI, and is explicitly mentioned as one of the research areas of the proposed National Competence Centre in Communication.

Thus development of research in this domain has an high priority, in order to achieve a sufficient critical mass;this will be done with following measures:

- Integration of the Swisscast project into the NCCR on communication sciences,which will be proposed by the Faculty of Communication Sciences at the USI;
- Development of other research projects using Swisscast push service as base application platform;
- Promotion of student's and doctoral's dissertations at the USI on this subject.

The system which has been developed in the Swisscast project will be used as as a basic platform where it will be possible to test advanced concepts,which aim to help the work information director and to improve the push service using more advanced developments in the information and retrieval technology;the main development areas which we can at the moment foresee are the following:

- Refinement of the gatherer module using intelligent agents to search the Web;
- Use of systems for automatic indexing to help the work of the information editor, focusing mainly on semanthic classification of contents (pure statistical indexing has been found not to be really useful for this type of application);
- Integration of keyword-based and full text search and push;
- Introduction of feedback mechanisms to automatically assess user's needs and review the classification scheme of the service.

While some of these areas do have a very high technological content, we will keep the main focuses of the project, i.e. the issue of information filtering & retrieval (relevance issues), that of the development applications centrered to the user's needs and that of an intelligent integration between human skills and technological systems.