

Icelandic Building Research Institute, Iceland.

The division involved in the project is the division of IT. The division on behalf of its institute was one of the founding members of the academic and research network in Iceland and later the first Internet provider in Iceland. Main research areas have been on Internet and web technologies and client/server architectures in construction. In the project it will contribute to the development and integration of value added services - deliverable over the Internet and related interoperability issues and API specifications.

Icelandic Building Research Institute

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Vienna University of Technology, Austria.

The unit involved is the Institute for Local Planning at the Faculty of Architecture and Planning. IFOER belongs to the pioneers concerning the implementation of (high-end) computer applications in planning. It also developed largest on-line index of abstracts for CAAD - CuminCAD - and brings the related experience into the project. In the project TUW will manage architectural content, state requirements and assess solution.

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Atlante, Spain.

Atlante is a 100% subsidiary of INDRA Group (biggest Spanish IT Services Group) focused on e-business services. It is a team of more than 300 professionals focused on the development and implementation of global customer tailored Internet Business Solutions, which cover the whole value chain of e-processes: from strategic and e-business consulting, through web design and creativity, to e-business SW development and e-business systems integration, to hosting and e-services. In this project, Atlante's main role is the deployment of Web based services, which they will exploit later to create knowledge management services.

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ISI has currently about 30 organisations being involved as Industrial Associates.

FGG Institute, Slovenia.

Technology park spin-off founded by the University of Ljubljana, Slovenia, and aimed at commercialising research and developments as well as consulting and design expertise of the Faculty of Civil and Geodetic engineering. FGGI has been involved with creating Web sites for the Slovenian chamber of Engineers, etc. In the process it uses tools for rapid prototyping of Web solutions. In the project they will use them to create early prototypes and final versions of the services.

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University of Salford, UK.

The Information Systems Institute (ISI) is a School within the Faculty of Business and Informatics at University of Salford, UK. It was founded as a partnership between Salford University and leading businesses in the United Kingdom, with the aim of producing graduates who can make an immediate contribution to the application of IT in organisations, and an emphasis on industrial collaboration. The ISI has currently about 30 organisations being involved as Industrial Associates.

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THE SCIX PROJET AT GLANCE

Scientists do research and write papers, as a essential part of their jobs; funded mainly by the taxpayer. Subsequently they give away the copyright to their work, for free, to commercial journals who publish these papers. Despite the fact that the scientists provide valuable services to the journals as editors and reviewers, they pay expensive subscriptions to these same journals, using public funding, so that they can learn about the work of their peers. This model worked well until the 1990's but the evolution of the Internet has totally changed the picture. In the SciX project we believe that transferring the copyright to scientific work outside of the scientific community has become an obstacle to an efficient scientific information exchange.

The SciX project will, through business process engineering techniques, examine the current and invent new business models, demonstrate that alternative models are technically and economically viable and study the obstacles to the change.

SciX is a 24 month project with an EU funding of €1.000.000. Co-ordinated by the University of Ljubljana (Slovenia), the partners include the Swedish School of Economics and Business Administration (Finland), the Icelandic Building Research Institute, the E-business company Atlante (Spain), the Vienna University of Technology(Austria), FGG Institute (Slovenia) and the University of Salford (UK).

SciX is pronounced *sigh-ex*.

THE SCIX PROJECT IN NUMBERS

Project no: IST-2001-33127
Project officer: Ms. Patricia Manson
Project funding: EU funding €1.000.000
Project effort: 200 person months
Project duration: 1.2.2002 - 31.1.2004
Partners: 7
Deliverables: 20

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BACKGROUND

SCIX: Open, self organising repository for scientific information exchange

The mechanisms for scientific publishing were shaped in the last two centuries and have so far remained almost un-changed by the Internet revolution. In the world which preceded word processing on personal computing and the communication channels offered by the Internet, commercial scientific publishers obtained their position in the publication life-cycle chain because they provided a clear value added service. Now almost all these reasons have disappeared. Scientists layout their papers themselves, the Internet offers a marketing and distribution channel operating at almost zero marginal cost. Nevertheless the academic community seems to have great difficulties in changing its attitudes and the way the publication system works.

A breakdown of the costs of producing and delivering to the reader a typical journal paper indicates that most of the cost consists of the actual research work leading to the paper. This part is usually financed by public bodies and is in no way recuperated through the sales of the journals. As a rule the authors get no monetary compensation for the preparation of the manuscripts (typically two-three weeks work). The next stage is the review; anonymous referees work for free and often get very little recognition for their valuable work. The next part is the technical publication process. For this part the publisher receives full compensation through subscriptions. But who pays these subscriptions? In the final analysis also these subscriptions are paid by universities and research organisations.

The last stage of disseminating the research results consists of making the journal available through libraries, through internal circulation in research organisations and university departments. In a process re-engineering exercise one should also include the work done by the reader to retrieve an article when it is needed, for instance by going over to a library and searching in the shelves, using a library information service to find out where the nearest copy is etc. Again such work is largely paid out of the public purse.

Thus one can conclude that if the actual writing and reading of publications is included in the analysis, then because of the commercial interests of a stakeholder incurring a very small fraction of the total life-cycle cost, the access to scientific publications is made highly restricted and the process as a whole is highly inefficient (given the opportunities offered by the Internet).

The dilemma is that it would be in the interest of the researchers and the public to have all this information published in a form which would make the overall process as cheap and efficient as possible. In essence this means published for free on the Internet, facilitating global access and hyper-linking of research publications. Nevertheless it is in the interest of the (mostly commercial) publishers to make a profit from selling this information, which leads to restricted circulation, pass-word protection schemes for digital versions of traditional journals.

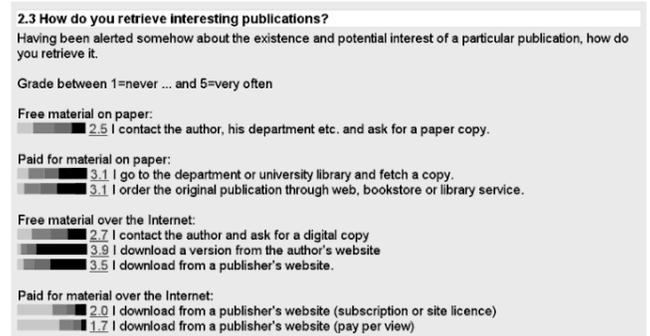


Figure 1. Some results from a recent web-survey of the reading and authoring habits of researchers in construction management and construction IT. Material, which is available free-of-charge on the web, is the most popular means for accessing scientific publications.

Pilot work to try out new methods of scientific publishing has already been started, usually by enthusiasts from subgroups in the scientific community. Important categories include:

Fully free refereed scientific journals distributed over the Internet

Digital pre-prints archives for not yet published material

Journals taking advantage of the technical opportunities for graphics, simulation etc. offered by the Internet

A few of these efforts have been successful, many have failed. A study in 1999 found more than 400 peer reviewed free journals on the Internet. Most of these were rather small and the mortality rate of journals of this category were around 25 % for the period 1996-98. On the whole only a small part of the overall volume of the scientific communication process has to date been affected. There are many psychological, legal and institutional barriers to change the process and these have been underestimated. These barriers need to be investigated more in detail and more systematically planned pilot work attempting to reengineer the process needs to be done and the results evaluated.



Figure 2. The CUMINCAD index is an example of a bibliographic service available for free on the web.

All in all there is a lack of sound business models and pilots to demonstrate the benefits of totally free scientific publication archives to the research funding organisations, which ultimately should fund the development and maintenance of these.

AIMS

The main goal of the SciX project is to demonstrate that the Internet enables new business models for the scientific publishing process that are much more cost and time efficient to the scientific community and the funding agencies, as well as to the industry. By the end of the project the project group will create services on the Web that will enable the scientists from the A/E/C community (1) time- and cost-efficient access to their peers' work, (2) create an on-line community of authors and readers and (3) disseminate scientific work to non-scientists, like engineers or architects.

To do so we will first analyse existing publishing practices and then (4) propose solid business plans for re-engineering the scientific publishing process taking into account also the legal, social and psychological barriers to change, try make the solution sustainable by (5) semi-automating the management of the service and creating (6) intelligent, adaptable user interfaces, (7) wrap scientific content for the practitioner's use and (8) evaluate solutions, estimate remaining human intervention, monitor the use and impact on the scientific community.

The work is partly on the conceptual level, partly in the form of development and in the demonstrating and testing of pilot systems.

The tasks of the conceptual part are to study the current scientific publishing process (as-is model) and propose more efficient (to-be) models using formalised process modelling tools.

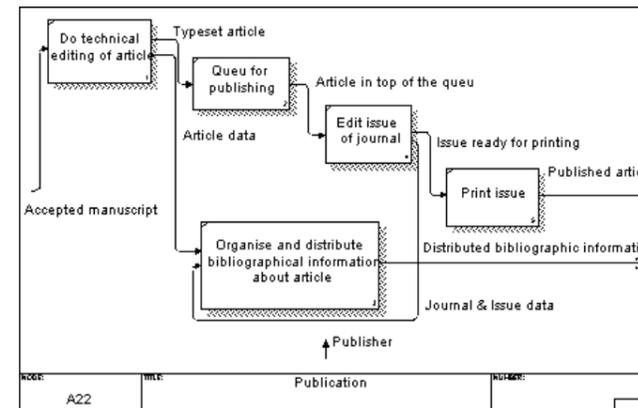


Figure 3: Sample IDEF0 diagram. This notation will be used in the business modelling part of the SciX project

Models will deal both with quality-assured peer reviewed publication and the publication of project reports, theses, conference and working papers. We will

- collect requirements from the end users of scientific information (from the scientific community and the industry).
- study the life-cycle economies of scientific publishing.
- investigate the social, psychological and legal barriers to the implementation of the more efficient to-be models.
- suggest value added business models that can be added on top of free services.

The technological tasks will re-use and augment partners' previous work and open source third party solutions to (1) implement the repository, (2) build an on-line virtual community infrastructure, (3) fill the archive with a critical mass of research papers, (4) develop technologies for the semi-automatic maintenance of the archive as well as for adaptive, intelligent, user interfaces; (5) create add on services; (6) further develop an existing peer-reviewed journal. The work will be monitored through regular surveys of user requirements and satisfaction.

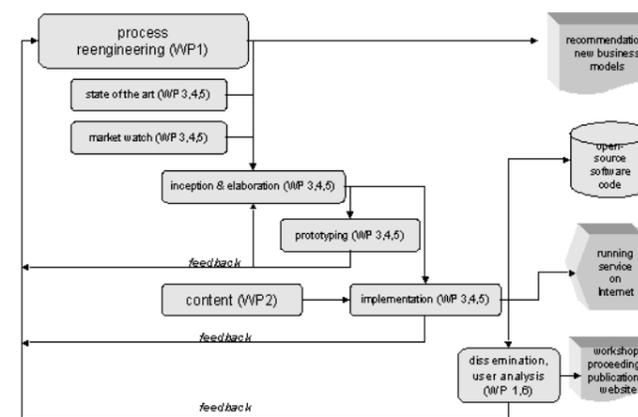


Figure 4. The main tasks and deliverables of the SciX project

REFERENCES

The SciX website at <http://www.SciX.net/>
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PARTNERS

University of Ljubljana, Slovenia.
It is the largest University in Slovenia. The unit involved is the Institute for Earthquake Engineering, Structures and Construction IT of the Faculty of Civil and Geodetic Engineering. It pioneered the use of Web technologies in construction (since 1993). To the project, LJU contributes knowledge on electronic publishing (ITcon journal, CUMinCAD index) and bridges the modelling and analysis task and the pilot software development ones. LJU will work on architectural foundations and design advanced agent based repository management and end user interfaces.

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Swedish School of Economics and Business Administration, Department of Management and Organisation (HANKEN), Finland.

The Information Systems Science unit (within the department of Management and Organisation) both teaches and is involved in research of how the Internet affects the business processes of different industries. The unit will contribute by its experience in business process modelling as well as its overall know-how of the scientific publishing process. In addition the Library unit of SHH will be involved to provide in depth know-how of one part of the publication process as well as a European network of contacts.

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