INFORMATION SOCIETY TECHNOLOGIES (IST) PROGRAMME

Contract for:
Demonstration project

SciX

Open, self organising repository for scientific information exchange

Annex 1 - “Description of Work”

Project acronym: **SciX**
Project full title: **Open, self organising repository for scientific information exchange**
Proposal/Contract no.: **IST-2001-33127**
Related to other Contract no.:
Date of preparation of Annex 1: **25.09.2002**
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Date: 2002.09.27 12:51:43 + 02'00'

Foreword:

This document is based on the project proposal taking into account the reviewer's comments as well as budget reduction. The main improvements include:

- Innovation related to the technical aspects of the work is downplayed; a demonstrator using available technology is planned for with limited new development that is not crucial to the outcome of the business reengineering part of the project. Overall testing and assessment of the proposed new business model is ensured.
- Dissemination is enhanced through the introduction of an international workshop as well as concrete plans of strengthening the contacts with the international and continental professional organisations.
- Exploitation plans and post-project feasibility of the solution are given attention in the project - in the assessment and evaluation of the pilot software..
- Workpackage structure has been simplified so that the number of technical workpackages has been reduced and the associated workload on these workpackages packages is now smaller. Nevertheless, technical work still needs to be carried out to ensure a platform on which results of business process reengineering could be demonstrated.
- Management structure has been simplified so that it reflects a smaller project - the functions of the technical manager and project co-ordinator and the respective boards have been merged.

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1. Project summary

Abstract: The scientific publication process has been so far only marginally affected by the possibilities of the Internet. The reason is a lack of sound business models and pilots to demonstrate the ultimate benefits of free scientific publication. A team of universities, Internet publishers and applied research institutes proposes to demonstrate these benefits and re-engineer parts of the scientific publication process by: (a) building a fully functioning on-line service, where scientific work, including results of EU projects, would be available for free (with content from architecture, engineering and construction - AEC) and where a virtual on-line community of authors and readers would meet. To support a business model where minimal costs are associated into the process it will enhance the technologies for the (b) self organising maintenance and (c) intelligent user interfaces and finally (d) define business models where scientific work would be wrapped by commercial sites that would make the content more appealing to the industrial audience.

Objectives: The main goal of the 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 the industry. By the end of the project we 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 the existing 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.

Description of the work: 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. Models will deal both with quality-assured peer reviewed publication and the publication of project reports, theses, conference and working papers. We will (1) collect requirements from the end users of scientific information (from the scientific community and the industry); (2) study the life-cycle economies, (3) investigate the social, psychological and legal barriers to the implementation of the more efficient to-be models; (4) develop a method to benchmark scientific journals; (5) 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 the 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.

The project should trigger a political discussion of an EU directive concerning free access to publications which are results of publicly funded research.

Milestones and expected results: Results: new business models for scientific publishing, up-to-date survey data on alternative publication models (based on at least 300 respondents), demonstration of a repository, with content (4000 papers, 300 registered users) and technologies for managing and using it.

Products: production grade software for running the repository, populated and put to use on the Web; made available under open-source, free to download license.

- Milestone 1 (after 9 months of the project): prestudies, state-of-the art, market watch, as is models, software requirements and architecture of most components is documented. Initial versions of the prototype core and wrapper can be demonstrated.
- Milestone 2 (after 18 months of the project): the to-be model, and the general study of the business models, comparisons of the economies etc. are completed; final version of the pilot core and wrapper are available, prototype of the advanced features can also be demonstrated. All architectural and some engineering content is available.
- Milestone 3 (end of project): The advanced features software is finished; pilot populated with data. Synthesis based on earlier studies an on the observation of the users of the pilot systems is made; final report, recommendations etc. are published.

2. Project objective(s)

The objective of this project is to demonstrate, (1) that the scientific knowledge management can be made much more efficient, (2) show alternative business models to the ones practised in the past, and (3) analyse social, economic, legal and other related issues.

2-4% of the European GDP that is spent on research and development - on creating new knowledge. While several projects deal with the management of knowledge that is created within the industry, little has changed in the past hundred years in the ways that knowledge, created by scientific research and published in scientific journals, is handled. The current mainstream scientific publication process has so far been only marginally affected by the possibilities offered by the Internet, despite some pioneering endeavours. This is not so much because of lack of enthusiasm, but because there is a **lack of sound business models and pilots to demonstrate** the benefits of totally free scientific publication archives to the organisations, which ultimately should fund the development and maintenance of these.

The objectives of this project are:

- to enable scientists time- and cost-efficient access to their peers' work by creating a repository of electronic publications;
- to make the scientific materials in the repository also available to non-scientists - engineers, architects from the industry and explore new business scenarios.
- to support building a virtual on-line community of authors and readers.

To do so we will:

- create the necessary services infrastructure and populate it with at least 5000 papers from the domain of architecture and engineering;
- strengthen the already started transition to new modes of scientific publishing process so that the cheap dissemination channels of the Internet are put to efficient use; we will do so by setting up infrastructure to set up an electronic journal and make it available under open source licensing;
- perform a social-economic analysis of new business;
- investigate the legal, social and psychological obstacles to using eWork approaches in this area as well; this will include a survey among about 300 of our colleagues on their views on e-publishing.
- develop a method to benchmark scientific journals based on user requirements in the Internet era.

Most technologies and software to implement that is either freely available or has even been developed by the partners in this project in the past. This includes the WODA database tool (www.ddatabase.com), Itcon journal infrastructure (www.itcon.org) and the CUMINCAD database (itc.fgg.uni-lj.si/cumincad/). These solutions will be further enhanced and put to use in this project.

2.1 ENABLE EFFICIENT ACCESS TO SCIENTIFIC RESULTS

The current methods for accessing scientific results are highly inefficient in view of the technical potential offered by the Internet and the fact that scientific research results, from the viewpoint of the public sector financing research, are aimed for reuse in other research and application in industry, not as a commodity to be sold per se for a profit. It would seem to be in the interest of the public R&D funding bodies (e.g. European Commission) and of the academic community as a whole to have a completely **free cyberspace of scientific information**, in order to speed up the scientific research process and save costs. The objectives of the project are to explore business models and techniques which: speed up the process from submission to final publication, allow a more rich content (multi-media), provide readers more efficient mechanisms for retrieving publications of interest and increase readership through the abolition of barriers such as subscriptions.

2.2 PROVIDE ACCESS TO NON-SCIENTISTS

Making the information available for free and with efficient search mechanisms could also dramatically increase the number of readers from industry and from smaller universities (the **SMEs** of the scientific community), who seldom can justify paying expensive journal subscriptions or have the time for extensive searches for information. For **industry** readers, a crucial factor is also the time spent in searching and retrieving relevant information, they want relevant information just-in–time, and can't afford the luxury of reading hundreds of papers just-in-case there is something of use for them.

2.3 RE-ENGINEER THE PUBLISHING PROCESS AND PERFORM A SOCIAL-ECONOMIC ANALYSIS

In this project a process reengineering view of the whole life-cycle process of scientific papers will be taken, with the intent to find **savings of 80-90%** in the distribution – retrieval costs. Compared to the 10-20 % approaches often taken in development projects initiated by commercial publishers and libraries, these savings are very promising. The key issue is the **paradigm shift** to see scientific publications not as a commodity to be sold or archived but as an essential part in a larger scientific communication process, and to look for solutions based on the premise of globally free information on the world wide web, thus **side-stepping some of the traditional intermediaries** altogether.

2.4 AUTOMATE REPOSITORY MANAGEMENT THROUGH SELF ORGANISATION

The amount of digitally stored technical data, both general and corporate, is growing rapidly - more rapidly than the ability of the humans to appropriately structure, classify or index it, so that it could be found and (re) used. Typically, this information is available through different search techniques. Searching, however, implies that the user knows what she is looking for. Another approach to access the data is through browsing, which requires a certain structure imposed over the data items. The main function of the structure is to provide user navigation through the data. The structure should tell the user what items are similar, which are different, and how. The simplest structures of this kind are clusters or groups of similar data items. By using data mining it is possible to create an algorithm that would create clusters of data automatically so that the clusters would be similar to the human interpretation of that data. For example, given one or a few papers related to certain topic, the machine should come up with a cluster of similar papers, which should be of interest to the reader as well. Such clustering becomes very interesting when applied to large repositories of publications, such as the one planned in this project.

The freely available clustering and automatic classification software will be put to use in the project.

2.5 SIMPLIFY USE THROUGH INTELLIGENT PERSONALISED AGENTS

Another important part of the project is a user profiling system that would add value in combination with the automation described above. Automatic notification on new papers matching the profiles' interest and selective searches will be provided without the need to build a very sophisticated profile. The user will be able to semi-automatically modify the query with assistance of the system and update her user profile.

2.6 INVESTIGATE LEGAL, SOCIAL AND PSHYCHOLOGICAL ISSUES

The main problem to a new vision of information exchange in science is the copyright that researchers currently **give away to the commercial publishers for free**, and which results in severe obstacles for potential readers to retrieve the information they need. There are also other barriers for a shift to free repositories dealing with perceived risks of Internet publishing, sluggishness of academic department to change their "rating" systems, etc which need to be studied. A survey we conducted in the year 2000 in the field of construction IT and management showed interesting results in relation to what scientists think about where to publish and what to read. We intend to continue this survey over the next years so that the trends could be monitored as well as the impact of the proposed repository.

2.7 DEVELOP BENCHMARKING METHODS FOR SCIENTIFIC JOURNALS

Typically scientific journals have been rated by prestige, often based on subjective evaluations or to some extent on the use of citation indexes. Ratings have been done implicitly through university departments, for instance in shortlists of accepted publications for promotion etc. Little attention has been paid to questions of how quickly and efficiently the information passes to experts for whom the information could be useful. Thus it would be very useful to develop methods, which would allow the benchmarking of journals for also other factors than the scientific quality of the papers (turnover time from submission to publication, availability, readership etc.). Such a benchmarking tool will be developed in the project and tested with a number of journals of different categories. The main value of such a tool would be as a tool increasing the awareness within scientific communities of the deficiencies of their current communication process, which hopefully will trigger activities to change the process.

3. Participant list

List of Participants

Partic. Role*	Partic. no.	Participant name[1]	Participant short name	Country	Date enter project**	Date exit project**
C	1	Univerza v Ljubljani, Fakulteta za gradbeništvo in geodezijo (University of Ljubljana, Faculty of Civil and Geodetic Engineering)	LJU	Slovenia	start of project	end of project
P	2	Svenska handelshögskolan (Swedish School of Economics and Business Administration)	SHH	Finland	start of project	end of project
P	3	Rannsoknastofnun byggingaridnadarins (Icelandic Building Research Institute)	IBRI	Iceland	start of project	end of project
P	4	Atlante Sistemas S.L.	ATL	Spain	start of project	31 March 2002
P	5	Technische Universität Wien (Technical University of Vienna)	TUW	Austria	start of project	end of project
P	6	Inštitut FGG (Insitute FGG)	FGGI	Slovenia	start of project	end of project
P	7	University of Salford	USAL	United Kingdom	start of project	end of project
P	8	Indra Sistemas S.A.	IND	Spain	1 April 2002	end of project

*C = Co-ordinator (or use C-F and C-S if financial and scientific coordinator roles are separate)
P - Principal contractor
A - Assistant contractor

** Normally insert “Start of project” and “End of project”. These columns are need for possible later contract revisions caused by joining/leaving participants

[1] English translations of the legal names are in brackets.

4. Contribution to programme/key action objectives

4.1 NEXT GENERATION DIGITAL COLLECTIONS (IST-2001-III.1.3)

The partners in the project believes that the next generation of archives of scientific works will be a digital collection that will be available nearly for free. The available technologies for managing and using such a collection will be demonstrated, as well as the associated business models.

A central objective for a freely available repository of scientific information is to make such information more easily available for professionals working with R&D **outside the academic organisations**, that traditionally subscribe to scientific journals.

With a continued growth of free time, an increasing number of citizens, including the elderly and those who for various reasons did not have the ability to get a university degree, are hungry for knowledge. It is quite impossible for them now to have access to academic press and results of academic work - such a repository would make the access to scientific works much more **democratic**.

The project also supports the **modern epistemological approaches** that claim that knowledge is also in the doing. Through discussion forums, the traditional knowledge "users" from the industry will get the opportunity to express their view and discuss the relevancy of the academic research.

Through the use of advanced IT, later in the project, it will be possible to demonstrate access to the repository through mobile **eBook** devices. We do not propose to develop such technologies, but demonstrate that a properly organised archive, through the use of **XML technologies**, can also make use of the **mobile Internet** of the future.

4.2 KNOWLEDGE MANAGEMENT (IST 2001 - II.1.2)

Scientific papers contain new knowledge in its purest form. The project proposes to re-engineer the process in which this knowledge is published (WP1) and demonstrate business models that make such approaches viable on the long run (WP5). While individual electronic publications exist, the project will offer a **completeness** and uniform **structure** of the information (WP3). It will offer a dynamic virtual organisation of those who publish and those who read and use the community to generate new **dynamic groups** (WP4). Because of knowledge sharing, collaboration and socialisation, such groups will become a fruitful environment for the **emergence of new ideas** and enhance creativity, innovation and competencies.

The intelligent search and automatic clustering techniques will be based on **axiology, ontology and epistemology of a scientific field** (WP4). User interfaces (WP4) will offer personalised, context-sensitive functionality for the dynamic provision and sharing of timely and relevant knowledge in the form of scientific publications. This project will use and validate novel “intelligent” knowledge management technologies, applications, methodologies and practices aimed at a corpus of a general scientific information. Full lifecycle of knowledge (i.e. capturing, organising, maintaining, mining, sharing and trading knowledge) will be supported.

4.3 PUBLISHING DIGITAL CONTENT (IST2001 - III.1.1)

The project specifically aims at testing new “business models”, taken in a broad sense, for publishing of scientific results.

4.4 SOCIO-ECONOMIC ANALYSIS (IST 2001 - II.1.1)

Knowledge is a commodity, which lends itself extremely well for e-commerce, since it can not only be marketed and sold over the Internet, but also delivered. Thus electronic publishing of scientific results can be regarded as a form of e-commerce, which nevertheless has quite curious border condition. As in the

dissemination of public and legal information the primary objective is not to make money from the sale of the information, but to provide the "customers" with a service that optimises the overall costs and benefits to society of the R&D process. There are many **economic, psychological and legal obstacles** to reach a more efficient process, because the current legal and organisational framework has been shaped by the state of printing and distribution technology before the advent of the Internet. A key objective of the project is to study these obstacles.

4.5 SMART ORGANISATIONS (IST-2001-II.2.2)

After the end of the project, the partners will most probably start a non profit organisation that will take over the management of the archive. It will show that on the Internet, a smart organisation can be very inexpensive.

Through the co-operation with value adding wrappers (WP5) it will demonstrate interoperability, seamless integration and knowledge sharing between heterogeneous enterprise applications and services. Applications like the one defined in WP6 will promote industrial co-operation.

4.6 DYNAMIC VALUE CONSTELLATIONS (IST-2001- II-3.1)

Through links with commercial knowledge infomediaries and Internet publishers, like partners no. 3 and 4, and through developments like WP6 the project will demonstrate innovative and visionary value creation models. In the current model of publication, the **publishers add little true value** to a paper based publication of an article. The author wrote it for free and gave the publisher the copyright for free. "Added value" of the publisher is, that it printed and distributed paper copies of the journal. Today we use the Internet to distribute and a desktop printer to print (if at all). Electronic repository enables, however, that **authors get a little money from every download of the paper**. Although our current view is that access should be free, we did investigate these issues in our survey and plan to do more so in WP1.

Perhaps readers and authors will create market driven value constellations, where they come together dynamically. The project is open to that.

4.7 NEW PERSPECTIVES FOR WORK AND BUSINESS (IST 2000 - II.1.1)

Although not considered a business, science is an important factor in every economy. EU countries contribute between 2-5% of their GDP for scientific development. Compared to the 10% that for example the construction sector contributes to the GDP, the **efficiency of the scientific process should be studied** just as processes in other parts of economy. The Internet enables new ways of work for the scientific community, but it also makes some business models of the dissemination of scientific results obsolete, while it enables others, which this project will explore and measure their usefulness and economy.

The subject area of the repository is architecture, engineering and construction. We are confident that more scientific information available from these fields would lead to more efficient use of the built environment and better city planning.

5. Innovation

Pre-prints archives are not new. There exist a few and the US is taking the lead. Europe, with its tradition of paper based publishers is lagging behind. But the goal of this project **is not just to create another pre-prints archive** but also to demonstrate, that technology is there and the innovation is required in process re-engineering and the invention of business models (sections 5.1 and 5.2) as well as in developing technologies for efficient **self-organising** management (5.3) and use (5.4) of the repository. The last two can be generally applied to any knowledge management problem. The first two to any information dissemination area. It is crucial for the success and relevance of electronic publishing **to bring together the technical, business and socio-economic factors**.

5.1 RE-ENGINEERING OF THE SCIENTIFIC CONTENT PUBLISHING PROCESS

The efficiency of the scientific publishing process is an import issue for society as a whole. R&D spending is in most industrialised countries at least 3 % of GDP and the indirect effects of research on developments in all sectors of society is evident. Nevertheless there has been relatively little R&D work looking at how the information dissemination works in this domain.

The mechanisms for scientific publishing were shaped in the last two centuries and have so far remained almost un-changed by the Internet revolution. The academic community seems to have great difficulties in changing its attitudes and the way the publication system works. 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.

A breakdown of the costs of producing and delivering to the reader a typical journal paper indicates that more than 90 % 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 mainly public authorities, who finance universities and most 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. And in the spirit of cost-benefit analysis, what is the penalty of all those occasions where relevant source material isn't retrieved because it would be too tedious, slow and costly.

Thus one can conclude that if the actual reading of publications is included in the analysis, then because of a commercial party incurring maybe 2 % 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. Even if we take the more limited life-cycle from manuscript preparation to retrieval of the publication by readers, excluding the research itself and the reading of the publications, the share of the publishers is nevertheless less than 10 %. The current process is grossly sub-optimised based on the interests of this minor party.

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. An interesting proposition which hasn't been tried out is to do the reverse of the current commercial trend, make the basic publications free, but charge for using the value adding search tools. Commercial publishers are currently doing the reverse, they offer the search tools for free to attract customers for the paid for digital publications. This is exemplified by an initiative such as the cross-referencing of citations in journals of the major scientific publishers, which in the near future will enable real hyper-linking of the publications of the different participating companies, with free access to the abstracts but not the full texts.

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 investigated more in detail and more systematically planned pilot work attempting to reengineer the process needs to be done and the results evaluated.

Such work will on a general level be undertaken in the proposed project. The proposed pilot work will be in the domain of construction information technology, due to the background of the research group. This is a suitable scientific sub-community since its spread rather thinly around the globe, often with single researchers at individual universities. Also the nature of the subject studied is such that researchers need rapid access to the latest research results. Nevertheless the results of the proposed research can be generalised to scientific publishing as a whole.

The project will follow the work being done in related Fifth framework projects, in particular the EPIFOCAL project (IST-1999-12090) which will provide a useful source of on-going work in the general electronic publishing domain, and TIPS (IST 1999-10419) which is looking at tools for innovative publishing in science. Work done in the OAI (open archives initiative), at Cornell and Michigan Universities, at NEC (Citeseer), at Los Alamos and in the Cyclades project will be taken into account as well.

The results of the project could be important inputs to EU-policy, for instance concerning publication of results stemming from research funded by EU money, but even more importantly concerning the publication of research results in Europe more in general. In principle it could be quite realistic to imagine a EU directive demanding that all results of publicly financed research in the member countries which are openly published should be made available for free over the Internet.

5.2 NEW BUSINESS MODELS FOR VALUE ADDING INFOMEDIARIES

One clear objective of the scientific community is to enable innovation and technical progress in the (construction) industry by mediation and subsequent exploitation of research findings. It has been established earlier in the text that existing business models have failed in accomplishing this task effectively. The existence of a free scientific repository and the associated technologies that this project proposes adds a new dimension in disseminating significant research and scientific results to the construction industry.

What is being proposed is an intermediary value adding service(s) that can be situated between the repository and industry practitioners (e.g. designers, engineers, contractors, software developers, manufacturers of building component and materials) in the value chain; a) on top of the repository as add-on services or b) as separate business identities. This introduces new players in the value chain, new business opportunities and new business models become viable.

The added value, that these services can provide, may range from simple grouping of context sensitive material, commentaries, summaries, reviews or editorials - catered to specific industry sectors like manufacturing, technology areas like information technology or structural mechanics, a discipline like architecture or social issues like environmental performance - by possible actors such as associations, building information centres, best practise and on-line learning sites. Actors looking to elevate the information exchange between the scientific community and their respective audience - and finally using novel Internet technologies for hosting (e.g. e-work, e-commerce etc.) and mediation.

The proposed innovation in value-added infomediaries builds on top of technologies developed in the SciX project by bringing together novel knowledge management functionality of the repository, Internet technologies and human expertise and creativeness to produce view(s) onto the scientific repository - properly edited, structured and formatted for industry. Technologies for maintaining infomediaries and mediating to end-users as well as to introduce new business opportunities and business models into this domains value chain.

5.3 SELF-ORGANISING AUTONOMOUS KNOWLEDGE REPOSITORY

Solutions for automatic handling of a repository of documents and multimedia are quite well developed. However, databases manage the files only, they do not manage the content. We propose to use innovative machine learning, data mining and clustering techniques so that the repository could manage with as little human intervention as possible, which is important if we want it to be self-sustainable in the future. How much human effort is required will be measured in the project as well.

Using data mining it is possible to create an algorithm that would create clusters of documents automatically and that the clusters would be similar to the human interpretation of that data. For example, given one or a few papers related to certain topic, the machine should come up with a cluster of similar papers, which should be of interest to the reader as well. Or, given a set of abstracts, the program would put similar ones together and assist in planning conference sessions.

We intend to investigate several algorithms such as CYBERMAP's matrix representations for similarity computation, single-link, which brings together documents that exceed a predefined threshold, CLASSIT, extended COBWEB algorithm that doesn't estimate similarity between individual objects, but overall quality of partition. And some more complex and less time consuming like K-means, GAHC, ARHP and others and some mixed approaches will be considered as well.

As a part of the state-of-the-art workpackage in WP4, these algorithms will be evaluated and compared. One, with open source code available will be selected and incorporated as a part of the code in WP4.

5.4 INTELLIGENT PERSONAL ASSISTANTS

We will establish a user centred profiling system that will treat the user as a person rather than generator of information needs. Such an approach has been approved as the most advanced trend by the R&D community in the area of the information retrieval systems. The system will use extended profiling that will take into account correlation with documentary information.

By establishing several mechanisms for automatic detection of relevant documents related to specific areas of interest and the history of the user profile will help the research community to focus primarily on the research work. Automatic notification on new papers matching profiles' interest and selective searches

will be provided without the need to build very sophisticated profile. User will be able to semi-automatically modify the query with assistance of the system and an up to date user profile.

Due to the fact that the history of the user profile and the profile itself can provide valuable information we will establish a strong privacy policy according to European privacy directive and the TRUSTe (trust and confidence measures on the Internet) rules.

5.5 VIRTUAL COMMUNITY

Electronic publishing allows for totally new levels community building as was best demonstrated by Web services like Egrops, Onproject, Napster etc. Electronically it is possible to trace (with full respect for anonymity and privacy) who is reading what, who else has similar interests, who has been searching for the same works, who comes similarly regularly to the repository, etc. etc.

This is something paper based journals cannot achieve at all, but dynamic social groups out of which research teams might evolve, are easily created through the proposed services. Virtual communities enable users of on-line services to exchange their views, engage in intellectual discourse, conduct commerce, exchange knowledge, provide relevant guidelines, make plans, brainstorm, educate them selves and others and one of the most important is to find people with similar interests. Significant influence of virtual communities is in that they allow people to do just about everything people do in real life, except those things limited to physical boundaries. Several internet-based services have gathered millions who have participated into wide range of subjects. These resulted in the richness and vitality of computer-linked cultures that was proven to be attractive, and sometimes even addictive. Towards our opinion providing and facts above we believe that community oriented service will be very helpful for users and will certainly bring scientific and industry community closer.

6. Community added value and contribution to EU policies.

This proposal deals with the efficiency of the communication part of the scientific process. Studies have showed (including one that was conducted by some of the partners in this proposal in 2000) that scientists spend between 50 – 60 % of their total time communicating (in meetings and conferences, reading publications, reading and writing emails etc). They read (or browse) on the average 120 scientific papers per year. Thus any improvements in the scientific communication processes, in particular technologies that minimise such non-value adding activities as sending material in paper mail, or tedious retrieving of source material from library shelves, could have far-reaching positive consequences. For informal textual communication this has already been demonstrated by the Internet. It was no coincidence that the email "revolution" started in the academic community.

6.1 EUROPEAN DIMENSION

It would be impossible and the results would be irrelevant if such a project would be carried out on a national level and we see little chance of carrying it out without support from an international body. Science is an international and highly networked activity, any projects aiming at developing new methods and processes, such as the ones included in this proposal, **need to be carried out by international consortia**. It is no wonder that so far the **US scientific community** seems to have been pioneering experiments with free scholarly publishing on the Internet. The country is the only one which is large enough to have a critical mass of scientists to run its own journals, in many cases independent of other countries, and due to the size of the country also the funding for such development efforts in terms of grants has been available. Long before the advent of the Internet, in the late 1970s the US congress, based on earlier research efforts funded by the National Science Foundation was considering legislation for a National Periodicals Centre, a central mega-repository of refereed journal articles from which separate copies of articles could easily have been ordered. This initiative, which was supported by many researchers was ultimately defeated through heavy lobbying by some publishers and large libraries.

The **only possible counterpart to the US in this domain could be the European Union**, since the scientists from the EU taken as a whole produce about as many scientific papers as their US counterparts. This project contributes to the de-monopolisation of some scientific exchanges, maintained by the US.

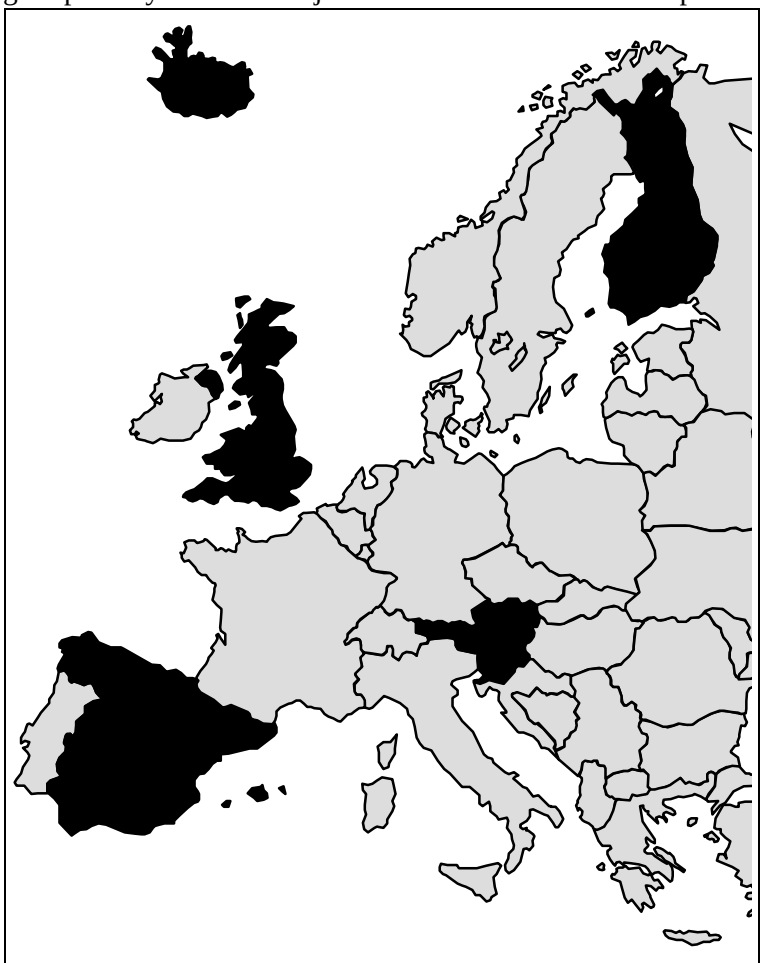

Figure 1: Partner countries.

6.2 EUROPEAN ADDED VALUE

The members of the consortium come from across Europe. We believe we have a good mix and balance between north and south, east and west, EU member states and candidates, between large and small universities and companies. The consortium brings together specialists with complementing know-how. Some have experience of work with process reengineering applied to the impact of IT on industrial

processes, others of the development of advanced IT-tools for the Internet. Some take the authors view, other represent the end users of scientific publications in applied industry near R&D. Not surprisingly, the largest interest for the project has been shown by the SMEs of research and university organisations, which have relatively bigger problems in ensuring the availability of commercial scientific information to the end users they represent, than the big universities which can make affordable package deals for site licenses of electronic journals with the big commercial publishers.

6.3 CONTRIBUTION TO EUROPEAN POLICIES

6.3.1 Making research more efficient

The European Union is focusing a lot of attention on making the R&D process in Europe more efficient, with programmes such as the Fifth framework programme, and thus it would seem natural to devote some funds to research concerning the efficiency of the scientific process itself.

6.3.2 Information society

The project is striving for an organised exchange of scientific works using advanced information technology. It contributes to the shift from the paper based to electronic publishing. Although it creates a free repository of scientific works, it invents business models of the new economy where added value access to this work (see WP 6) can be commercialised. By easing the access to (scientific knowledge) more workers could become "knowledge workers".

6.3.3 SMEs

The project is particularly friendly to the SMEs among the research organisations and universities. In perspective it would enable them free access to scientific work. Currently they may be paying thousands of Euro's for a yearly subscription of a single journal. This project should enable them, their students and professors, to access it for free. Also SMEs in the industry cannot afford to subscribe to paper base journals. Typically, they also have a problem in that only a minority of papers are of real value to them, and they can’t afford spending a lot of money and time browsing through uninteresting material. A value added wrapper service would remind users of the interesting works that are available for free, and could help remedy this problem.

6.3.4 Standardisation

The project will examine, extend and enhance standards for the documentary metdadata, particularly the standards that originated in Europe, such as the Dublin core metadata standard. Through the librarians in our organisations we intend to work closely with new developments in this area.

6.3.5 EU regulations

Given the technical developments and that the proposed project demonstrates that large scale migration to free electronic publishing is feasible and even optimal compared to the current process, an interesting result could be the start of a debate about a possible European directive concerning the free availability of publicly funded research results on the Internet. Regulations are already being planned concerning the public broadcasting of important sports events such as world cup football. Would there not in consequence be an even stronger case for seeing to it that scientific information produced with public funding would be rapidly available free of charge.

6.3.6 Integration of European Science and Technology

Through the virtual community service., the visitors of the repository will be able to work together nearly as if they were working in the same institution.

7. Contribution to Community social objectives.

At a first glance, the only user of this repository is the scientific community. But this is only superficially so - it is the **scientific research**, the knowledge, that is **powering the new knowledge and eEconomy** and making this one more efficient contributes just about every social objective on the community's agenda.

Besides, the **current publishing situation does lock up** the results of scientific research to a few privileged scientists who can afford thousands of Euros for a subscription. A free, electronic repository **democratises the access to the knowledge** and we feel the community policymakers should do something about it.

The planned repository would deal with scientific works related to architecture, civil and structural engineering and construction. By shaping the built environment and the infrastructure, such as road, water supply, sewage etc. this industry has perhaps the largest impact on the quality of life and environment.

Construction is the largest industrial sector in Europe, ahead of foodstuffs and chemical industries, being responsible for 11% of GDP and up to 11 million jobs. The construction industry is also perhaps the most geographically diverse industry, and one which involves a very large number of small to medium sized enterprises (SMEs) - 97% of some 2 million companies have less than 20 employees, and 93% have less than 10. Enhancing the dissemination of research and scientific results to the construction industry is an important factor for future progress and innovation that affects the whole of the European community.

Although this project addresses the construction industry specifically, the specification and prototypes developed will be open for public use that enables technology transfer and cloning of deliverables for exploitation in other scientific areas and industrial sectors.

7.1 ECONOMICS

Public bodies and funding organisations that invest in scientific research expect a return on their investment. In order to maximise their return it should be in their best interest to have results from scientific work disseminated to a wider audience, both within the scientific community as well as to industry for further development and exploitation.

7.2 EMPLOYMENT

By de-constructing the traditional value chain and introducing new business actors the new business models that this project aims to define will promote opportunities in e-work and e-commerce that directly employs knowledge workers. Furthermore the new possibilities in knowledge delivery and education and training will make the workforce more competitive in the emerging knowledge community.

7.3 EDUCATION AND TRAINING

The establishment of a free repository of scientific work would make a serious difference in education and training for the construction industry on the whole in the quality of available scientific material and more significantly, would provide opportunities to support on-line education and training. It would also help educators in preparing and updating course material, students in higher education doing research and would aid in the development of training courses for industry practitioners.

7.4 WORKING CONDITIONS

The construction industry is manly composed of SMEs with limited extra resources to further their technological and professional skills. eWork and access to quality information and knowledge will greatly influence the chances of construction SMEs to compete and participate in the new digital economy. A

survey conducted in the UK stipulated that designers spend 70% of their time searching, accessing and working with construction information of which 50% is just devoted to searching. Consequently old and outdated information is too-often used. The project proposes two important aspects in improving current working conditions in construction SMEs - a) an adaptive, intelligent easy-to-use user interface supporting eWork and knowledge management and b) access to a repository of scientific work accessible free to the construction industry.

7.5 QUALITY OF LIFE

The construction industry and the scientific community strive to achieve improvements in construction productivity by technical innovation and integration of the construction process. Any slight improvement will deliver the citizen with lower construction costs, higher quality, safer and more durable housing. We believe that by improving the information exchange of scientific work, the foundation on which is built, these objectives will be more easily achievable.

7.6 ENVIRONMENT

One of the most active research areas in construction right now is related to environmental performance (green construction) and sustainability of the built environment. Improving information delivery on life-cycle issues, durability of building material, construction waste and recycling of demolition material and industrial by-products, frequent issues dealt with in research and scientific papers, will greatly expedite this process as this project proposes.

Designers experience pressure from facility owners who stress the importance of environmental issues in design of new facilities as a strategic move to gain a reputable standing both in the community and market as well as strengthening the long term marketing image. This leaves them at a disadvantage, as information involving these issues is not readily available.

8. Economic development and S&T prospects

This project is about creating a non-profit repository - so there are **no immediate economic prospects**. However, we showing below that the **economic significance is in the order of magnitude of 0.5% of the European GDP** - that is very roughly $50*10^9$ Euros. In this view the potential ROI of this project is about 40000-fold.

However, the consequent profits and savings are immense! In this project, a process reengineering view of the whole life-cycle process of scientific papers will be taken, with the intent to find **savings of 80-90%** in the distribution – retrieval costs. Compared to the 10-20 % approaches often taken in development projects initiated by commercial publishers and libraries, these savings are very promising. The key issue is the **paradigm shift** to see scientific publications not as a commodity to be sold or archived but as an essential part in a larger scientific communication process, and to look for solutions based on the premise of globally free information on the world wide web, thus **side-stepping some of the traditional intermediaries** altogether.

This project will make R&D process itself (3-4% of the European GDP) more efficient by developing and testing new models for the dissemination of research results. Scientists spend 50-60 % of their time communicating and any innovations that facilitate their communication with peers and with industry have far-reaching benefits, as we can witness with the proliferation of the Internet, which really started in the academic. An important part of this communication process consists of reporting on research result in form of drafts, conference papers and peer reviewed scholarly articles. On average academics read more than 100 such publications per year, using an average of 52 minutes for each. This also means that they spend weeks every working year searching for and retrieving relevant information. There is also "cost" of opportunities lost because they may overlook important publications because of not being alerted of their existence, or because its too tedious or costly to get hold of them.

If one assumes that the R&D accounts for 3 % of GDP in the EU countries and that scientists spend around one fifth of their time reading and retrieving scientific publications, then the **economic significance of this activity could roughly be estimated to be in the order of 0,5 % of GDP**, thus not at all negligible. European GDP is estimated at 10 trillion (10^{12}) Euros. Any improvements in this process will thus bring measurable savings (in the sense of freeing scientists for more creative value-adding tasks). Also getting access to timely and relevant publications just-in-time when you need them will improve the quality of the research undertaken. Currently it typically takes about one and a half year from manuscript submission to final publication in print journals, which is quite unacceptable in quickly evolving fields, such as IT research.

Up until a few years ago the only mechanism for disseminating scientific results were in the form of paper publication, now the Internet has changed the situation dramatically. Now there are a number of options available:

- The traditional paper based journals and conference proceeding
- The electronic copies of the above, still accessible only through subscription or pay per view
- Electronic only refereed journals which are free of charge
- Haphazard copies of all kinds of material on the home pages of authors or their institutions
- In a handful of domains of science free electronic pre-prints archives

Of these options the traditional paper journals and conference proceedings still account for the majority of publications retrieved, but the downloading of "haphazard material" for free is quickly catching on. The big drawback with that is that such material usually escapes efficient indexing and is thus mostly retrieved as a result of a citation elsewhere, thus side-stepping paying for the "official versions". The market share of the free electronic journals is still very small (a 1999 study found some 400 such journals whereas the total number of scholarly journals is estimated at between 80000 and 100000 thousand. There are only a handful of successful free electronic pre-prints archives.

In conclusion only a very minor part of the totality of scientific communication is handled in an organised and efficient way taking full advantage of the opportunities offered by the Internet.

8.1 TANGIBLE DELIVERABLES

The tangible deliverables of this project are the repository itself, value adding wrapper, including the data, the code that runs it, and the prototype solution.

- **Repository with data.** The academic partners are looking forward to the availability of this resource. In perspective it should substantially cut down the expenses for subscriptions to paper based journals. The academic partners are also well positioned to promote it in the engineering and architectural communities. The resource as such, however, is non profit, but saves money to the scientific community as a whole and consequently to the taxpayer.
- **Code.** The code for the pilot repository will be made freely available to any other scientific community wishing to implement a similar repository. Therefore the above benefits would be leveraged across Europe.
- **Value added wrapper** will create a new business and income source for the hosting partner.

8.2 DISSEMINATION STRATEGY

The results will thus be published through as many channels as possible, including both scholarly and more popular articles, information on the web site, but also rather massive marketing of the results via emails to emails lists of relevant decision makers. In addition researchers from the project will take part in a number of conferences dealing with issues related to scientific publishing.
During the project one seminar will in particular be arranged which assembles the key experts of the domain.

In particular a number of international organisation for researchers in different areas of architecture and civil engineering will be continuously informed about the progress of the project. These include: eCAADe, the CIB and IABSE . Such organisations can towards the end of the project put quite powerful pressure on their member universities and research organisations (ie. VTT, TNO, CSTB, BRE) to start using the repository services and to ensure a steady stream of publications.

A workshop will be organised in year 2 with the goal of bringing together some key people working in the area of electronic publishing. This will both popularise the results of this project as well as steer its course.

8.3 SCIENTIFIC PROSPECTS

The project will add to the scientific knowledge in the area of information systems. Quite a lot of research has been done in library science over the past few decades, but the study of how the Internet affects the scientific publication process is only now emerging, through the pioneering work of a handful of individual researchers, most of whom North Americans. The unique contribution of this project would be the use of rather formalised process reengineering methods to develop models of the as-is and to-be processes and to quantify the possible cost reductions in a publication life-cycle perspective. No such research has to our knowledge been published or even undertaken. Also the research would challenge the mainstream paradigms that projects with a background in the commercial publishing world and the library organisations usually are based on.

Those technical parts of the project, which deal with the functionality of the repository and the search mechanisms, would contribute to the scientific discipline of knowledge management, in particularly for the issue of how knowledge generated in the academic world can be retrieved and used by experts in industry-near development work as well as by practitioners.

8.4 STRATEGIC IMPACT

The participating software companies, aim at creating capabilities for which there will be a market demand also in the prevalence of free scientific information on the Internet. Clearly even in that scenario many activities remain that have a cost, the main change compared to the current situation being that it is not the end readers of publications that pay by subscriptions, rather research funding bodies, libraries or professional institutions which assume the new role of running digital repositories. Thus there will be a demand for relatively cheap standard applications for setting up pre-prints archives and electronic journals (now each new initiative usually sets up its own web site, and only the large commercial publishers have the benefit of scale effects).

The proposed project does not per se aim at developing new business opportunities for the participating university partners. The participating university researchers have an interest in developing their expertise in the sub-domains of the proposed project (the analysis and process reengineering aspects, the technical platforms), which can be reused in future projects. As academics they naturally also have an interest in making contributions to science in this relatively new exciting area, and in providing a very valuable service to their scientific sub-communities (construction IT). The dissemination of scientific knowledge in most sub-disciplines of architecture, engineering and construction is still done in the traditional way using printed material. A pre-study that some of the partners in this proposal conducted in the winter 2000 showed, however, that an increasing amount of knowledge is also disseminated over the Internet. Thus a pilot effort in this area would be extremely timely.

In the case of the Library department of Svenska Handelshögskolan the project is important in developing new skills and know-how that can be used for developing the strategic role of the library in a period when the traditional roles of university libraries will be questioned.

The overall success of the project is naturally very dependent on a follow-up by other domains in setting up free scientific repositories on the Internet. There are already quite a few in existence but their share of the overall “traffic” of scientific information is negligible. A 1999 survey found around 400 free scholarly journals published for free on the Internet out of a total estimated number of 80000 to 100000. There are pioneering preprints repositories but again their use is limited to a few communities, such as physics. Thus the single most important aim of the sciX project is to demonstrate the business case for free Internet publishing, both on the level of a new potential category of publishers (scientific associations, libraries, universities) and on the level of society as a whole thus talking of the large national funding bodies not to mention multinational players such as the European Union. In order to achieve some effect an important part of the project will thus be dissemination of the results to reach decision makers from these types of organisations.

8.5 EXPLOITATION PLAN - academic partners

The participating university researchers have an interest in developing their expertise in the sub-domains of the proposed project (the analysis and process reengineering aspects, the technical platforms). As academics they naturally also have an interest in making contributions to science in this relatively new exciting area, and in providing a very valuable service to their scientific sub-communities (construction IT). Being involved in a setting up scientific journals and preprint archives generates a lot of contacts to colleagues all around the world, which is very useful for any scientist.

In addition to TUW's interest to get access to scientific information, Prof. Bob Martens chairs the eCAADe (Association of Education CAAD in Europe / www.ecaade.org). This is a non-profit making association registered in Brussels. Since 1983 a number of Annual Conferences was hosted and in total more than 700 papers were published. Making this knowledge available would contribute highly to the further development of this field. Mutual exchanges with other CAAD-Associations, such as ACADIA (North America), CAADRIA (Asia and Australia) and SiGraDi (Latin America), have been established which altogether could benefit from this project by means of the establishment of a repository for scientific information exchange.

The Information Systems Institute of University of Salford is concerned specifically with the application of Information Technology in business and industry, and knowledge management, and this is reflected in its structure, its course provision, and its other research, consultancy and technology transfer activities. The ISI will exploit the results from the SciX project through direct consultancy, spin-off research projects, and particularly commercial training, education and seminars. In particular, the ISI will set up a UK User Interest Group to disseminate the results from the project, in accordance with the SciX consortium agreement. The SciX results will also be disseminated through the network of University libraries in the UK, particularly those Universities in which significant work is being carried out in the construction IT domain.

The SciX results promise to be particularly beneficial in facilitating the transfer of research knowledge into SMEs, and it is important that the results and expertise gained are passed on to such organisations. To this end, the ISI will seek to encourage the use of the SciX services within Teaching Company Schemes in the construction IT area. The assistance of the Construct-IT centre of excellence, a national organisation based at Salford and including around 50 major companies, 11 universities, and a number of standardisation bodies, will be sought to encourage the dissemination and exploitation of the project results across the UK industry and academe.

Plans for the wide promotion of the demonstrated platform and its take up will be planned in the **Dissemination and use plan**. The target use group will involve the organisations in which the partnes in this project have an active role. Some were enumerated above. Representatives of those organisations will be asked to join the **external advisory board** of the project.

8.6 EXPLOITATION PLAN IBRI

One could describe a (building) research institutes in Europe as an information bridge between academic scientists and industry researchers and practitioners. They leverage knowledge and information from the first through reading of scholarly scientific papers and conferences to the latter. They do it (1) either as publicly funded bodies (IBRI is obligated by the law to follow up on and subsequently inform and report to the industry new scientific developments both national and international that are of relevance to the construction industry) or (2) commercially through technology transfer to their large base of industrial clients, or (3) through their own R&D projects usually with a considerable stake from industry. At IBRI, overwhelming costs have cut down subscriptions of journals and professional magazines by half in the last 5 years, which compromises the institute's role.

Much the same argument can be applied to professional associations and organisations. Value added services as proposed in SciX enables these the structuring and dissemination of scientific and research results in a way, which is acceptable by the industry and thus elevating their competencies in delivering their role.

Industry requires scientific material beyond that offered by journals and conference paper to improve their competitiveness and extend markets. More specifically properly edited, structured and formatted to have successful impact in industry.

IBRI is an EMBRI member and will disseminate information about this project to other EMBRI members and push forward prototypes of value-added services and related specifications and technologies developed within this project to encourage uptake and wider use. EMBRI members can create the critical mass needed for early exploitation of deliverables in Europe.

8.7 EXPLOITATION PLAN FGGI

FGGI will be developing rapid prototypes of the services and tools envisioned in the project. It is planned that these services and tools will be freely available for download after the project ends. This does not mean, however, that FGGI does not have a commercial interest in the project:

- By participating in the project, the FGGI will further develop its code base for quick creating of Web services. It intends to reuse that code in the commercial efforts it is undertaking both in Slovenia as well as world-wide.
- Even though it will give away code to set up repositories of scientific papers for free, so that researchers from other topics could easily set up services similar to SciX, previous experience with other services and tools have shown that this typically generates consulting revenue. Even though the code may be free, the organisation setting it up needs help with the installation and could also be interested in extensions and customisation.
- Participation in such a highly profiled project, FGGI expect to receive technical and commercial contacts as well as generate promotional value for the company.

SciX is also an excellent opportunity for FGGI to prove the concept of a faculty's spin-off company, which is a rather new concept in the former "eastern" Europe.

8.8 EXPLOITATION PLAN INDRA

Indra (the company where is now integrated Atlante as its e-business Unit) will exploit and benefit from Scix in several ways by:

- Providing specialised expertise to other user companies wishing to support their organisational knowledge with the right publications. SciX will enable Indra to offer its existing customers (from many sectors) the implementation of a free and personalized publication retrieval. Indra will increase the set of services offered by its e-business unit and therefore will be able to differentiate itself from competitors.
- Earning revenue from sales of the technology developed in SciX.
- Acquiring the know-how and technology for further exploiting this area of business based on the development of high added value services.

Indra will also benefit by acquiring technology for automate repository management and personalized agents. Further interests include.

- Increasing the number of potential customers. Visibility of SciX via dissemination will give Indra an advantage with new customer contacts and provision of complementary services to present ones. SciX will provide Indra with new customers. New companies wishing to use the SciX services will hopefully contact Indra as a reliable company involved in high technology systems development.
- Keeping pace with technology to improve differentiation of Indra from competitors. SciX will enable Indra to be at the leading edge of automate repository management and agents technology, giving a competitive advantage in terms of differentiation and services offered and reinforcing the image of the company as deeply committed to the deployment of technology to its core business.
- Increasing the commercial and technology agreements with other European companies. SciX will also permit Indra to establish contacts, both technology and commercial, with other European companies wishing to conclude both types of agreements.

In terms of ROI (Return of Investment) analysis, the ROI of this investment should be more than 50% per year for Indra, which is a very high ROI, however an in accordance with the normal growth rates and revenues from technological companies and services.

9. Workplan

9.1 GENERAL DESCRIPTION

The project combines some scientific research, some software development and customisation and business process reengineering. They complement each other, however, because of the different nature of the work, they cannot be planned in the same way. In the presented outline we believe we have found a way to achieve both state of the art scientific results as well as practical advances and software and information technology.

9.2 INTRODUCTION

9.2.1 Project structure

The project's structure combines the:
- deliverables (products),
- partners (resources)
- tasks (process) and

There are three kinds of deliverables:
- models, studies, benchmarking methods, process re-engineering concentrated mostly in workpackage (WP) 1.
- pilot software and Internet services (WP 3,4,5).
- meta-deliverables, dissemination and use plan, publications and Websites, exploitation plans, assessment and evaluation documents (WP6 and 7).
- management reports (WP8)

There are the following kinds of participants:
- academic organisations and (no. 1,2,5,7)
- their libraries (no. 1,2);
- transfer to practice and knowledge management company (no. 3),
- publishers (no.4,6).

The kinds of tasks include:
- research and analysis of the scientific "business" processes
- technology and software development
- dissemination, promotion, exploitation
- project management.

The project structure reflects this in a transparent way. We believe that the most important outcome of the project are the deliverables, therefore, the **deliverables determine the projects break-up into work packages**.

9.2.2 Work package overviews

WP1 is involved in process reengineering. In the first phases of the projects it studies the as-is situation, gathers the requirements etc. while later it monitors and evaluates the change and measures, through surveys, the impact that the repository is making. Based on some of the results of this workpackage, demonstrators are being created, however, the work on this WP continues and also analyses the use of the pilot and incorporates that into the final recommendations.

WP2 contributes initial digital content into the repository, first by itself, but after the repository is up and running it starts to fill itself, because a growing relevance of material available attracts users to bring in more material.

WP3 creates the core functionality of the repository. WP4 enhances it with advanced features for the repository manager and the end user.

WP4 enhances the core with some advanced functionality for both the end user and the manager.

WP5 creates a wrapper service that should demonstrate how the industry could benefit from the free scientific publishing model.

WP6 taks care of the dissemination, implementation and take-up.

WP7 handles the assessment and evaluation.

WP8 is dedicated to project management.

Partners are assigned to the work-packages and tasks according to the following principles:

- each WP should have a clear leader in terms of man power assigned;
- each WP should combine researchers, developers and users so that they complement each other. Research provides innovative aspects based on requirements by users. Developers assess the innovation to check if it is practical to implement. Developer's base their work on research results and are assessed by the end users.

In this way the project is using the partner's interests and expertise to steer itself.

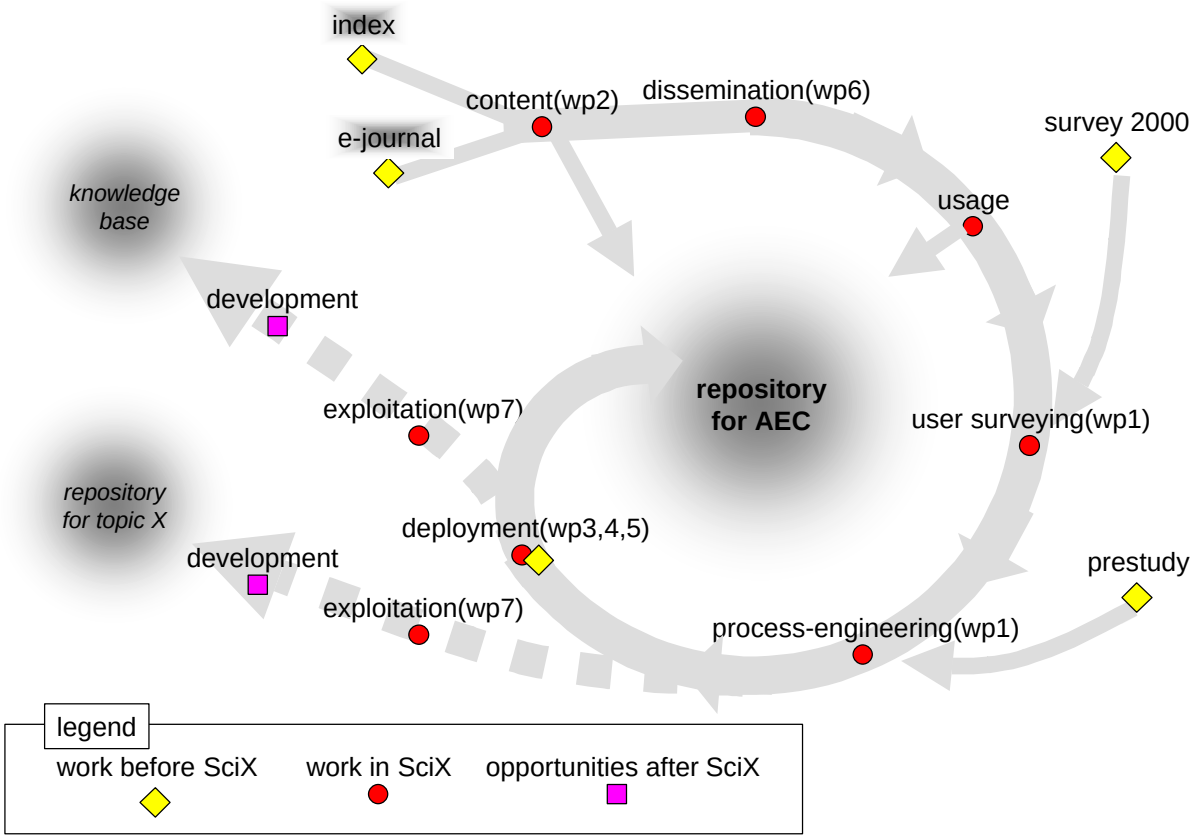

Figure 2: A dynamic view on the project's structure.

Figure 2 shows a more dynamic view on the project and how its different components fit together. The reader should start at the two diamond shaped clouds labelled index and e-journal in the left-centre-top of the figure; These are results of our existing efforts in using the Web for scientific information exchange,

which we cannot make explicit, because of the blind nature of this proposal, however, partners were leading this effort in the field of architecture, engineering and construction since 1993.

This brings some initial content. More content is supplied by WP2. Once content is in the repository, it can be announced on the Web, it will be used and the use will generate even more content. Users will be surveyed, which together with the survey from year 2000 and the pre-studies we made, feeds into the process reengineering workpackage. New models and requirements are inputs to the software oriented R&D in WP3,4,56, which lead to repository functionality, however, they might spin off to new business models (WP7), repositories for other topics or exploitation after this project (knowledge bases).

9.2.3 Methodology of the deployment/development workpackages (WP3,4,5)

The internal structure of the software and services deliverables follows the software engineering principles. They are typically broken into:

- **State of the art study**. Literature and scientific research in the related area are studied. Partners in this project made contributions in this area, however, due to the blind nature of this document we cannot refer to them.
- **Market watch study** to determine what commercial developments exist, identify competition and related risks. This study should also identify the off the shelf tools and technology so that the readily available tools are used.
- **Inception and elaboration** which includes requirements analysis, architectural foundation and the design of the service. From the process models defined in WP1, the functionality for the core repository will be determined through the development of use-case models leading to suitable object models. . This functionality will be defined and published in the form of a fully documented, open API (Application Programming Interface) providing services on which the more sophisticated elements regarding the autonomous repository, the personalised assistance and the wrapper service. This approach will allow new functionality to be added as experience with the system grows.
- **Prototyping** which starts in parallel to the inception and elaboration phase so that solutions and ideas can quickly be tested, evaluated and presented to the end users. Prototype will be made on top of available technologies, most likely implemented in Perl language and deployed on freely available platforms such as Linux, FreeBSD and Apache.
- **Implementation**. Prototype will evolve into a more stable, professionally looking, stable, reliable application. It will implement the revisions to the architecture and functionality identified during the prototype stage.
- **Assessment and evaluation** where the implementation is judged by the users. The initial prototype as well as the final professional version will be assessed and evaluated through field trials carried out in conjunction with the user interest groups in each of the participating countries.

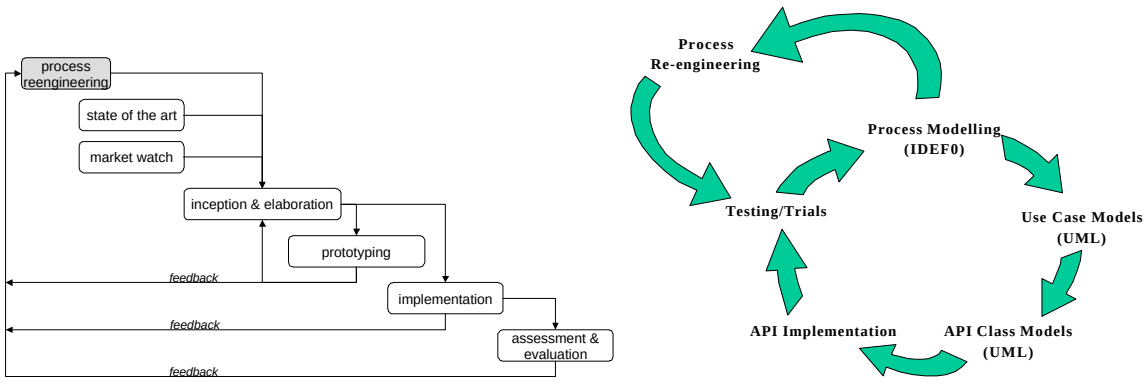

Figure 3:Relations between tasks in WPs 3,4,5. Note that they all feed from and than back to the process reengineering work-package. Figure on the right shows the relation between the re-engineering work and the inception and elaboration in greater detail.

The SciX system will be based on the client-server architecture shown below. The core repository will provide the functionality for storing and managing publications, and additional services such as cross referencing and indexing as determined during the process modelling and re-engineering.

The functionality of the APIs will be determined from the process modelling and re-engineering work carried out in Workpackage 1. The diagram on the right of Figure 3 shows the relationships between the activities in WP1 and WP3. From the "as-is" and "to-be" process models developed in WP1, use case models will be developed to determine the precise functionality required of the SciX repository. From these use cases, object class models will be created, which will act as the specification for the SciX Server API.

Use-case models will also be developed in conjunction with workpackage 4 for the repository management activity. These will be used to extract the requirements for the repository management API.

Care will be taken to define explicitly the division of responsibilities between the Repository and the Repository Manager, and between the Repository and agent/wrapper technologies to ensure the maximum flexibility for future development of particular aspects of the system by the consortium members or by other parties.

The API will be published as part of deliverable 7 (Inception and elaboration on for the repository), and will also be made available on the web-site to allow third party developers access if required. The software architecture of the deliverables from work-packages 3,4,5 and 6 is shown in Figure 5 below.

We intend to study and demonstrate commercially viable business models that aim to provide a) researchers and scientists and b) industry practitioners with view(s) on to the scientific repository that is properly translated, edited and structured to be of added value to target audience groups by bringing together the capabilities of innovative information technology and human expertise and creativity.

The added value, that these services can provide, may range from simple grouping of context sensitive material, commentaries, summaries, reviews or editorials by possible actors such as associations, building information centres, best practise and on-line learning sites. Actors looking to elevate the information exchange between the scientific community and their respective audience - and finally using novel internet technologies for hosting (e.g. eWork, eCommerce etc.) and mediation.

Furthermore this workpackage will aim to provide:

1) an infrastructure for integrating value adding services, manage (high level) access to knowledge management functionality of the repository core API, support for mediation mechanisms including user support and alternative navigational paths through the repository such as industry specific classifications.
2) the basic data models and functionality to support implementation as described above that includes the support for the needed human expertise and intervention in editing, structuring, formatting and managing material at the service level for instance on-line editing, reviewing, grouping etc.
3) demonstrate and validate by prototyping an editorial service as an add-on to the repository and an on-line training tool as an independent commercial service.

9.3 GRAPHICAL PRESENTATION OF THE PROJECT'S COMPONENTS

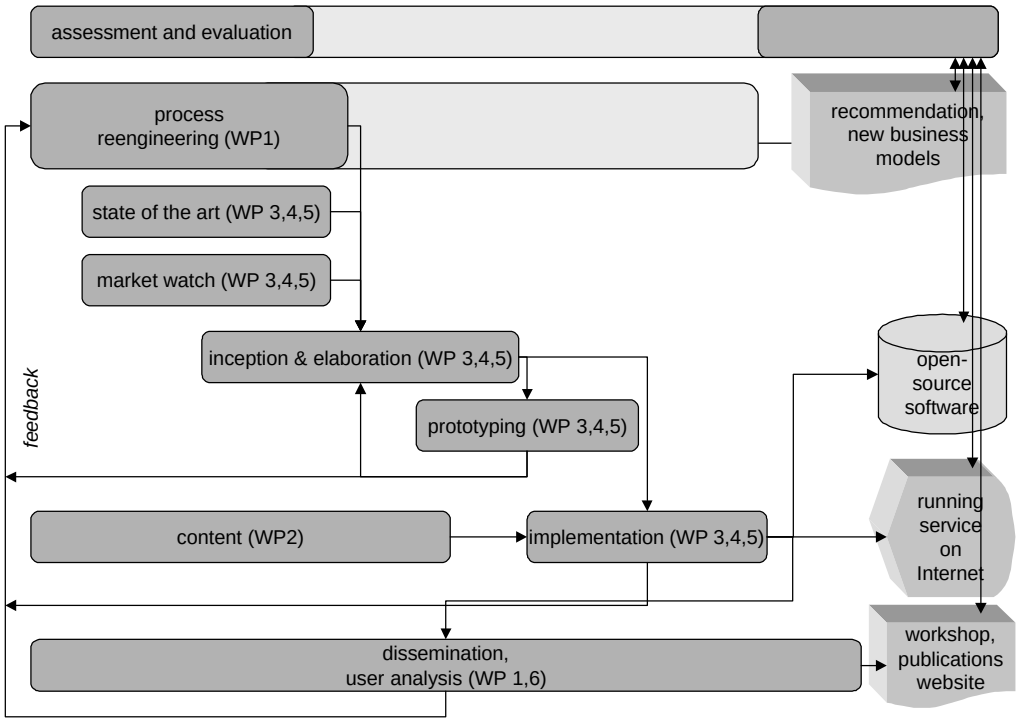

Figure 4: Project components

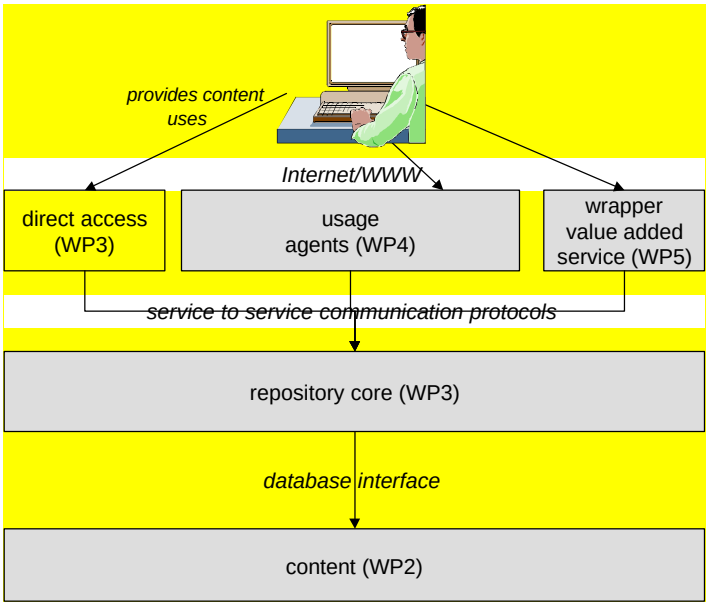

Figure 5: Rough software architecture showing another view on the relations between the workpackages.

9.4 WORKPACKAGE LIST

Work-package No	Workpackage title	Lead contractor	Person-months	Start month	End month	Deliverable No
1	Process and social-economic analysis	SHH	36,7+2	1	24	1,2,3,4,8,20
2	Repository content	TUW	19+2	1	24	5,6,7,12,20
3	Repository core	FGGI	23,1+1	1	24	8,9,10,13,20
4	Intelligent maintenance and use	LJU	23+1	1	24	8,9,10,14,20
5	Value adding wrapper service	IBRI	26	1	24	8,9,10,15,20
6	Dissemination and implementation	ATL / IND	31+6	1	24	16,17,18,19,20
7	Assessment and evaluation	LJU	11,3+2	1	24	7
8	Project management	LJU	18,5+2	1	24	all
	TOTAL		188,6+16			

Note: the person months are expressed as a sum of two numbers. The first is the EU funded effort and the second the estimated time the permanent staff of the AC partners will spend on the project.

9.4.1 Workpackages, tasks, task leaders summary

					Partner number							
	WP/ Task	**Description**	**sum**	**Lead par-tner**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
WP	**1**	**Business process modelling and social-economic analysis**	**38,7**	**2**	**4**	**18**	**1**	**0**	**2**	**2**	**6**	**5,7**
T	1.01	Literature study	3	2		3						
T	1.02	Current and future Web business models and payment systems	5	4								5,7
T	1.03	Formal process/information/business model (as is)	3	2		3						
T	1.04	Repository and e-journal requirements analysis	7	7	1	1	1		1		3	
T	1.05	Formal process/information/business model (to be)	4	2	1	3						
T	1.06	Comparison of the economies of the as-is and to-be models	3	2		3						
T	1.07	On-line survey (design and implementation)	5	1	2	1				2		
T	1.08	Study of the barriers to process change	8	2		4			1		3	
WP	**2**	**Repository content**	**26**	**5**	**5**	**1**	**2**	**0**	**7**	**4**	**2**	**0**
T	2.01	Analyse content sources in architecture	2	5					2			
T	2.02	Analyse content sources in engineering	3	7		1	1				1	
T	2.03	Provide initial content in architecture	6	5	1				5			
T	2.04	Provide initial content in engineering	5	6	1		1			2	1	
T	2.05	E-journal infrastructure	5	1	3					2		
WP	**3**	**Repository core**	**23,1**	**7**	**3**	**0**	**2**	**1**	**0**	**8**	**4**	**5,1**
T	3.01	State of the art study	2	7							2	
T	3.02	Market watch study	3	1	1			1				
T	3.03	Inception and elaboration	6	7	2		2				2	
T	3.04	Prototype	3	6						3		
T	3.05	Implementation	8	6						5		5,1
WP	**4**	**Intelligent maintenance and use**	**55**	**31**	**4**	**0**	**1**	**0,5**	**0**	**10**	**4**	**4,5**
T	4.01	State of the art study	2	7	1						1	
T	4.02	Market watch study	4	7	1			0,5			1	1
T	4.03	Inception and elaboration	7	1	2		1				2	2
T	4.04	Prototype	4	6						3		1,5
T	4.05	Implementation, integration with core	7	6						7		
WP	**5**	**Value adding wrapper service**	**29,4**	**3**	**1**	**0**	**19,4**	**0,5**	**0**	**0**	**3**	**2,5**
T	5.01	State of the art study	3	3			2				1	
T	5.02	Market watch study	4	3			2	0,5				2,5
T	5.03	Inception and elaboration	7	3	1		4				2	
	5.04	Prototype	1	3			1					
T	5.05	Implementation, integration with core	10	3			10,4					
WP	**6**	**Dissemination and Implementation**	**41,3**	**4**	**10**	**8,3**	**1**	**0,5**	**5**	**1**	**6**	**5,5**
T	6.01	Exploitation, dissemination and use plan	7	3	2	1	1		1			2
T	6.02	Website	5	1	2			0,5		1		1,5
T	6.03	Project presentation materials	6	2	1	2					1	2
T	6.04	Workshop	4	1	1	1					2	
T	6.05	Establishing of Target user group, promotion	9	4	2	2			4		1	
T	6.06	Final report / publication	6	1	2	2,3					2	
WP	**7**	**Assessment and evaluation**	**14,3**	**1**	**3**	**0**	**1**	**0,3**	**2**	**0**	**3**	**4**
	7.01	Methodology	3	4	1			0,3			1	1
	7.02	A&E of business process reingeneering	4	7	2						2	
	7.03	A&E of pilot software	6	4			1		2			3
WP	**8**	**Project management**	**21,5**	**1**	**10**	**2**	**1**	**0,2**	**1**	**1**	**4**	**1,3**
T	8.01	Overall management, internal Website	8	1	8							
T	8.02	Workpackage management	6	all	1	1	1	0,2	1		1	1,3
T	8.03	Quality assurance, risk management etc.	6	7	1	1				1	3	
		Grand total	**204,3**		**40**	**29,3**	**28,4**	**3**	**17**	**26**	**32**	**28,6**
		Goal PM	188,3		34	25,3	28,4	3	13	26	30	28,6
			16		6	4	0	0	4	0	2	0
		Unfunded PM			6	4	0	0	4	0	2	0

9.5 WORKPACKAGE DESCRIPTIONS

9.5.1 Wp 1: Process reengineering

B3. Workpackage description

Workpackage number :	1								
Start date or starting event:	project start								
Participant:	LJU	**SHH**	IBRI	ATL	TUW	FGGI	USAL	IND	sum
Person-months per participant:	4	16+2	1	0	2	2	6	5,7	38,7

Objectives

The overall objectives are to study the current scientific publication process, its shortcomings and the opportunities offered by the evolution of the Internet, and to propose and implement an alternative process which would be significantly more cost effective than the current one. The proposed alternative process will provide the basis for the test implementations done in the other work packages. The work will take a life-cycle viewpoint on scientific publications, thus starting from the research itself, and including the writing of papers, printing and distribution, but also archiving and retrieval by end users. The modelling of both the current process (as is) and the alternate process (to be) will be done using formal process modelling tools. A study will also be made of the psychological, economic and legal barriers to changing the processes.

Description of work:

1.01 Literature study: The most recent literature and international projects from the area of electronic publishing and scientific publishing will be studied. The existing body of research knowledge about the scientific publication process will be surveyed, in particular for obtaining data from empirical studies about the cost of different phases of the life-cycle (ie. printing and distribution cost per article, archiving costs etc.).

1.02 Current and future Web business models and payment systems: A study will examine the business models that are being used on the web as well as future trends in this area. It will include an overview of payment systems, including micro-payments, which could be a useful way of making scientific repositories not entirely free, but quite inexpensive.

1.03 Formal process/information/business model (as is): A formal process model of the current scientific publishing process will be created For this task the IDEF0 modelling language (of which several of the partners have experience from earlier reengineering projects) will be utilised. The important innovative aspect of this (compared to some earlier studies) is the inclusion of early activities such as the research itself and late activities such as archiving, information searching and retrieval, and reading of publications in the overall analysis. The ensuing model will be tested on experts from the publishers, libraries and scientific community in order to validate it.

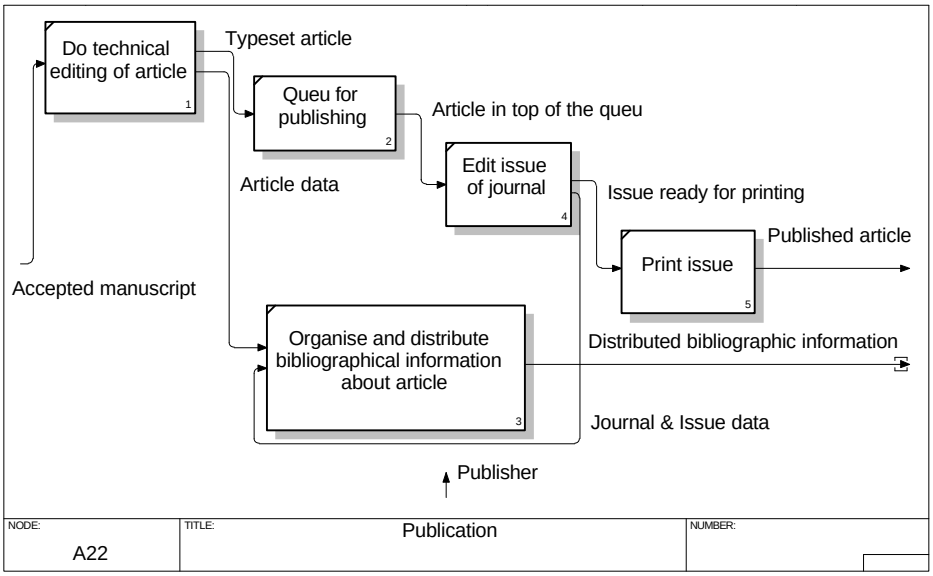

Figure 6: Sample IDEF0 diagram. This notation will be used in business modelling of WP1.

1.04 Repository and e-journal requirements analysis: An initial requirements analysis will provide the requirements of the scientific and professional communities to the repositories. This work will build on and extend a survey on the use of the Internet in AEC R&D already conducted in February 2000. A renewed survey will be carried out at least two more times during the duration of the project so that trends will become apparent. In addition, in-depth interviews will be conducted with a number of persons, representing different categories of actors. This task builds on top of the previous tasks and provides input to the pilot software development.

1.05 Formal process/information/business model (to be): Based on the emerging functionalities of the pilot software a to-be business model will be defined, using the same BPM tools and notations. The to-be model will influence the development of the pilot and the recommendations for future enhancements. The premise for the ideal model is that the information published on the www should be free of charge and access unrestricted. The hypotheses is that this entails significant savings also compared to the electronic option of the as-is model. The model will also be validated by a panel of experts.

1.06 Comparison of the economies of the as-is and to-be models: This is a crucial task in proving the potential benefits of the reengineered process. The analysis will be conducted using the as–is and to-be models as a basis. Since it would be impossible to carry out full scale empirical comparison the study will be done by collecting evidence of the average costs of the different phases from the literature, by interviews with editors etc.

1.07 On-line survey (design and implementation): A survey on scientist's views on electronic publishing was made in 2000 and the results published. A similar survey will be repeated again in 2002 and possibly 2004 and results compared and trends analysed. At least 300 scientist should be surveyed.

1.08 Study of the barriers to process change (incl. surveys): The results of this task should explain why the transition towards electronic publishing is taking such a long time. The experiences of early pioneers of the free scientific journals will be collected. In most cases the barriers to change have been greatly underestimated and so far relatively few free electronic repositories have been successful. A significant part of the journals founded in 1996-98 have disappeared. Barriers are psychological (scientists fear that web journals lack archival stability), institutional (a scientist publishing in a free journal earns less “premiums” when he is considered for promotion compared to one of the traditional, established journals, etc.) and legal (copyright issues). The outcome of this task will be a description of the barriers and proposals for how they can be overcome.

For more information: innovation is described in 5.1.

Related deliverables (see 9.6 for details)

1 Scientific publishing: as-is business and information model
2 Scientific publishing: to-be business and information model
3 On-line survey software
4 Recommendation, model comparison
8 Technology: market watch, state of the art and requirements analysis

Milestones and expected result

The workpackage provides input to the development workpackages, steers and monitors them. The results are also useful by providing new scientific results and suggesting guidelines to policymakers - demanding free access to results obtained with public funding.

Milestone 1: As is model, requirements for software
Milestone 2: To be model, comparison
Milestone 3: Synthesis, recommendation

9.5.2 Wp 2: Repository Content

B3. Workpackage description

Workpackage number :	2								
Start date or starting event:	project start								
Participant:	LJU	SHH	IBRI	ATL	**TUW**	FGGI	USAL	IND	sum
Person-months per participant:	5	1	2	0	5+2	4	2	0	21

Objectives

Web services of this nature are often trapped in a vicious circle. If a repository is empty, people are not motivated to enter their own data into the repository, therefore, the repository remains empty. The objective of this workpackage is to cut this vicious circle by providing an initial set of content that would establish the resource as a relevant one. Then the snowball effect would take care of scientists being personally interested in entering their work by themselves and would do so.

Smart acquisition techniques will be developed, so that manual work in the entering of the initial fund of papers would be minimised.

A key issue in assuring the success of a repository is to fill it straight away with enough initial content to make it attractive to readers to come back to it and to subsequently input their own papers into it using the automated procedures. Otherwise many people will, prompted by the first email announcement, have a first look, but be disappointed with the current content and the usefulness of the service, and refrain from later inputting their own material. One must also remember that scientist do not get any merits from uploading their publications to a pre-print server, in contrast to conference proceeding and refereed journals, where the merits gained is the key issue.

To get the initial content, a vast body of earlier publications must be made digitally available in the repository. Papers in conference proceedings of various kinds will constitute the bulk. This is because a majority of the conferences in the building construction area have been organised by non-profit organisations or university department who have also acted as publishers. Thus getting copyright to publish the material should not be a problem. In fact a large part of such proceedings from the 80's and 90's are out of print and very difficult to get hold of for individual potential readers, so one could assume quite a bit of enthusiasm from the original editors (and authors) for getting the material published again in this way. It is also noteworthy that the key participants in this project have acted as past organisers of such conferences, members of boards of scientist's association etc., and personally are in a position to control the access to more than one thousand papers from conferences in the 90ies. Two of the partners have also taken part in setting up a web service based on abstracts for a sub domain of construction IT, which already indexes thousands of items.

A key issue to be solved in this project is how to convert, index and input thousands of old publications into the repository in a cost-efficient way. Most of the material is only available on paper and thus scanning needs to be performed. Some more recent material will also be available as word processing files of different sorts, and for some recent conferences material may be stored on CD-ROMS or in HTLM on web sites (especially abstracts). Since we talk of thousands of papers, any savings per paper in the routines and IT-methods used will be extremely important and the results are applicable to any other scientific domains who attempt similar repositories. As an example automated routines for identifying abstracts and key words in scanned in material could be very helpful to avoid manual work.

Thus important parts of this work will be identification of relevant source material, negotiations to get access to materials from third parties, and the technical work of scanning, converting and indexing the material.

Description of work:

2.01 Analyse content sources in architecture: this will include setting up contacts and liaisons with several international organisations where scientists in the field work such as eCAADe, CAADfutures, ACADIA, CAADRIA, SiGraDi CORP, IAPS etc.

2.02 Analyse content sources in engineering: a similar effort will be made in the field of civil engineering - with organisations like CIB (w78), IABSE, ASCE, EAPPM etc. where partners in this project have excellent contacts.

2.03 Provide initial content in architecture: available content sources, established above, will be examined; content will be included into the repository.

2.04 Provide initial content in engineering: available content sources, established above, will be examined; content will be included into the repository.

2.05 E-journal infrastructure: an interesting aspect of e-publishing are electronic journals. One is being run by the partners in this project. Its infrastructure will be augmented to support the publication process in a better way and made available for any other electronic journals to use.

Related deliverables (see 9.6 for details)

5 Content sources and acquisition techniques
6 Initial content architecture
7 Initial content engineering/construction
12 E-Journal: Infrastructure pilot

Milestones and expected result

Milestone 1: Content sources identified, some architectural content available.
Milestone 2: All architectural content, some engineering content available, first prototype of the e-journal support available.
Milestone 3: E-journal support available. Repository populated with thousands of full texts of the relevant papers in the field from the last 5-10 years. Methods for keeping the archive to-data and growing specified so that **long range sustainability of the effort is ensured**.

9.5.3 Wp 3: Repository core

B3. Workpackage description

Workpackage number :	3								
Start date or starting event:	project start								
Participant:	LJU	SHH	IBRI	ATL	TUW	FGGI	**USAL**	IND	sum
Person-months per participant:	3	0	2	1	0	8	3+1	5,1	23,1

Objectives

The objective of this WP is to develop the core functionality of the repository system in a first prototype and a later professional version. It should be able to accept, store, search and deliver scientific papers (as many existing systems today do) but it should also be extendable to support the advanced features planned in WP 4 and 5. Therefore the architecture of the whole system is designed here as well as the core data structures exchange formats.

It will be based on the requirements defined in WP1 and will build the basis for the integrated self-managed autonomous knowledge repository system. The software for the core system will be deployed, installed at the user sites and tested.

More information on methodology in Section.

Description of work

3.01 State of the art will examine integration architectures and full text database technology, including advances in the fields of CORBA, DCOM and XML/SOAP.

3.02 Market watch will examine similar existing systems, for example the largest such repository - Los Alamos in the US and the free servers for distance learning. Pre-study is showing that most of these systems are technically well below current state of technology.

3.03 Inception and elaboration
3.04 Prototype
3.05 Implementation These tasks follow the methodology described in Section 9.2.3. Innovation is described in 5.3. Prototyping and development will use the WODA (www.ddatabase.com) rapid database development tool.

Related deliverables (see 9.6 for details)

8 Technology: market watch, state of the art and requirements analysis
9 Overall architecture report
10 Overall implementation report
13 Core pilot

Milestones and expected result

Milestone 1: Architecture and prototype
Milestone 2: Final version

9.5.4 Wp 4: Intelligent maintenance and use

B3. Workpackage description

Workpackage number :	4								
Start date or starting event:	project start								
Participant:	**LJU**	SHH	IBRI	ATL	TUW	FGGI	USAL	IND	sum
Person-months per participant:	4	0	1	0,5	0	10	3+1	4,5	24

Objectives

The goal of the WP is to provide smart user interfaces (search browse, interact with users) and tools that will assist in the maintenance of the repository. A goal is also to provide an estimate how much effort it takes to manage such a repository manually (as a part of the study in WP1).

Functionality will be implemented through community-oriented components and tools. These include a user-profiling system that will allow sharing of knowledge discovery process to other users, community building service, tools to build and maintain special interests groups etc. Special focus will be given to real-time interactions between groups of user with identified common interests (tracing user paths on invitations, public discussions, etc).

The repository, that will be created during this project, should be almost self sustained after the end of the project. Then it would be managed on a voluntary basis in the same way as scientists, for free, manage commercial paper based journals today. This workpackage would create the technologies that would minimise that effort and manage the repository in effect self-organising.

The system would let the scientists around the world to add papers to the repository. The paper would then be checked, if it is appropriate for the repository, if the structure and formatting guidelines are obeyed. It would then be passed on to a an editorial agent that would look at the contents of the paper, extract keywords and classify the paper according to the repository's classification system and also assign the paper to the correct cluster. Notifications would be sent to the appropriate human editors, who work on the subject, so that they could verify or revoke any decisions made by the agent. After this clearance by the human editor, the paper would be fully available in the repository.

The scientific output measured in pages of papers, reports and PhD theses is growing exponentially. It is getting increasingly difficult for scientists to follow all new developments. The just-in-case browsing through journals, just to keep in touch with the subject, is a luxury, which our pre-study showed, can be afforded by fewer and fewer members of the community. An alternative are searches through specialised (COMPENDEX, ICONDA) databases or on the Internet, which are performed on the just-in-time basis. Using the first, the scientist is still far away from the full text of the publication. Generally, just-in-time searchers do not broaden ones horizons - one only finds what he searched for. In this workpackage technologies would be developed that are between the just-in-case and just-in-time access methods. User's preferences would be either explicitly specified or machine-learned from her interaction with the system. Then this information would be used to bias search results during interactive use or push new items or information about peers with similar interests to the user by email. Solutions would be created that measure readership of publications and that would cluster readers accordingly. In this way a user would also benefit by the system that will be learning from the whole group, not just from individuals. A sense of artificial community would be created.

Description of work

4.01 State of the art study: State of the art study will cover most of the developments in the area of personalised information retrieval systems and the use of user profiling as integral part of the systems. Different models and algorithms will be studied covering retrospective systems and interaction of user profiling and querying techniques. It will provide needed information for further development of automatic clustering techniques, text and data mining related algorithms and research issues (e.g. TREC, CONTEXT, I). Available classification systems and possible implementations for web-based representations will be considered.

4.02 Market watch study: Internet search engines into which some partners in this project also made a contribution, are studying intensively how to improve relevance of search results. This will be examined and successful implementations of the systems will be analysed (e.g. husky search). Preliminary examination of the market did not show any significant use of advanced profiling on the Web. Additionally. the market watch study will focus especially on commercial data mining tools, visualisation of textual data and their functionality. Market watch will include both information retrieval systems and applicable developments by the producers and vendors of document databases (ie. LEXIS-NEXIS, DIALOG, OCLC, etc).

4.03 Inception and elaboration
4.04 Prototype
4.05 Development. These tasks follow the methodology described in Section 9.2.3. It will use the WODA (www.ddatabase.com) rapid database development tool and classification work done at the University in Ljubljana in the CONNET project and later (paper by Cerovsek, Turk, Martens).

For innovation see Sections 5.3, 5.4 and 5.5.

Related deliverables (see 9.6 for details)

8 Technology: market watch, state of the art and requirements analysis
9 Overall architecture report
10 Overall implementation report
14 Intelligent maintenance and use pilot

Milestones and expected result
Milestone 1 Initial design and architecture ideas.
Milestone 2 Fully functional prototype
Milestone 3 Fully functional final version

9.5.5 Wp 5: Value adding wrapper service

B3. Workpackage description

Workpackage number :	5								
Start date or starting event:	project start								
Participant:	LJU	SHH	**IBRI**	ATL	TUW	FGGI	USAL	IND	sum
Person-months per participant:	1	0	19	0,5	0	0	3	2,5	26

Objectives

The overall objectives are to study and demonstrate new and modified business models in the value chain of electronic scientific publishing that provide added value to customers. More specifically business models that aim to provide a) researchers and scientists and b) industry practitioners with view(s) on to the scientific repository that is properly translated, edited and structured to be of added value to target audience groups by bringing together the capabilities of innovative information technology and human expertise and creativity. This will include a study of; what the new business models may look like, who the business actors are, range of infomediaries possible, mediation and exploitation mechanisms and where they may position themselves in the value chain. The work packet will also provide the infrastructure, data models and tools to support creation, maintenance and interoperability of wrapper services. The work draws from previous work-packets for development of an interoperability platform for integration of value added wrapper services.

Moreover this workpackage will aim to provide:

1) An infrastructure for integrating value adding services to manage (high level) access to knowledge management functionality of the repository core API, support for mediation mechanisms including user support and alternative navigational paths through the repository such as industry specific classifications.

2) The basic data models and functionality to support implementation as described above that includes the support for the needed human expertise and intervention in editing, structuring, formatting and managing material at the service level for instance on-line editing, reviewing, grouping etc.

3) Demonstrate and validate by prototyping an wrapper service as an add-on to the repository and an on-line training tool as an independent commercial service.

4) Implement an on-line service that will be reusing or wrapping content from the core repository in such a way, that it will be suitable and appealing for the professional's -engineers and architects.

Innovative aspects are described in 5.2.

Methodology

Numerous web-based services can be found on the Internet that provide access to scientific material. Add-on services associated with these are typically discussions forums, reviews of journals, books, conferences and papers and some generic editorial work. As the support for these services is normally on volunteer bases the outcome is firstly less focused, -complete and -coherent often when dealing with very complicated issues and secondly they are mostly targeted at peers in the scientific community but not the general population of industry.

What is being proposed is a platform for intermediary value adding wrapper service(s) that can be situated between the repository and industry practitioners (e.g. designers, engineers, contractors, software developers, manufacturers of building component and materials) in the value chain; a) on top of the repository as add-on services or b) as separate business identities. This introduces new business actors in the value chain, new business opportunities and new business models become viable.

We intend to study and demonstrate commercially viable business models that aim to provide a) researchers and scientists and b) industry practitioners with view(s) on to the scientific repository that is properly translated, edited and structured to be of added value to target audience groups by bringing together the capabilities of innovative information technology and human expertise and creativity.

The added value, that these services can provide, may range from simple grouping of context sensitive material, commentaries, summaries, reviews or editorials by possible actors such as associations, building information centres, best practise and on-line learning sites. Actors looking to elevate the information exchange between the scientific community and their respective audience - and finally using novel internet technologies for hosting (e.g. eWork, eCommerce etc.) and mediation.

The software development workpackages will follow the methodology as described in Section 9.2.3.

Description of the work

5.01 State of the art study: State of the art study will look into trends and developments of web-service business models, on-line payment systems, push technology and on-line learning and training in construction in the context of the value added service for scientific publishing.

5.02 Market watch study: Market watch will examine existing systems, offering similar customer based information services and their respective business models. Commercial and open source software for XML authoring, content management and relational data management to be used in the wrapper service will be reviewed. The Market watch will also include a study into the use of construction classification systems that are already established and widely in use on the market for browsing and grouping of information.

5.03 Inception and elaboration:
5.04 Prototype:
5.05 Implementation, integration with core: The technical solution of this service will, on purpose, use different tools and technologies, to demonstrate that the core of the service is open and that its interfaces are openly available. XML and SOAP are candidate technologies for establishing these links. Main stream SQL databases and related Web development tools such as MySQL, MS-SQL Server, XML for SQL Server 2000, .NET and JAVA are the candidates in the prototyping and implementation.

Related deliverables (see 9.6 for details)

8 Technology: market watch, state of the art and requirements analysis
9 Overall architecture report
10 Overall implementation report
15 Wrapper service pilot

Milestones and expected result
Milestone 1 Design work completed, early prototype can be shown.
Milestone 2 Implemented, integrated with core.
Milestone 3 Assessed and evaluated.

The work in this work-package will result in an per-pay on-line service that will be reusing or wrapping content from the core repository in such a way, that it will be suitable and appealing for the professionals - engineers and architects.

9.5.6 Wp 6: Dissemination and Implementation

B3. Workpackage description

Workpackage number :	6								
Start date or starting event:	project start								
Participant:	LJU	SHH	IBRI	**ATL**	TUW	FGGI	USAL	**IND**	Sum
Person-months per participant:	8+2	6+2	1	0,5	3+2	1	6	5,5	37

Objectives

To ensure that (1) the project findings are reported to the scientific community, (2) that the services on the Web are **used, become popular and remain active** after the end of the project and (3) to **generate new business opportunities** for partners using the technologies developed in this project.

Description of work

6.01 Exploitation, dissemination and use plan contains the exploitation plans as well as plans for the dissemination of the project results and the use of the project results after the end of the project. This task and the related deliverable plan the work in the other tasks in this workpackage. Concerning exploitation a technological implementation plan will be provided, being a specification for the exploitation of this project. It will contain technical information as well as exploitable potential developed during the project and plans to realise the potential. Special section of this document is focussed on exploitation and outlines the estimated market potential for every partner and related activities (e.g. the TIP).

6.02 Website Dissemination of results will start almost from the beginning of the project with the help of an Internet web-site that is set up no later than in month 3 and regularly updated. The site will contain all public results of the project and electronic versions of the project presentation materials.

6.03 Project presentation materials Project handouts and leaflets as well as posters will be produced in order to be used as dissemination material for interested users as well as at any kind of dissemination events (exhibitions, symposia, conferences …).

6.04 Workshop A workshop will be organised during the second year of the project to disseminate project's results and get feedback from the key people from the field of electronic publishing. A number of invited speakers is foreseen.

6.05 Establishing of Target user group, promotion The project will invite conference organisers to use the infrastructure developed in this project to electronically publish the proceedings. The project will work with existing e-journals to allow for representation of those papers in the repository. The project will invite EU project partners, particularly from IST, to use the infrastructure as a dissemination platform. European wide publications in newsletters and industrial magazines will also be elements of a more traditional dissemination channel.

6.06 Final report / publication Final report will be published as a printed bound volume and also electronically.

Related deliverables (see 9.6 for details)

16 Dissemination material and website(s)
17 Workshop, event and proceedings

18 Promotion, SIG, on-line community
19 Dissemination and use plan
20 Final report

The results of this work package are expected to provide a significant scientific contribution as well as an important input to policymakers in the EU and individual governments as regards the future development of the process. Thus it is imperative that the results are quickly spread in the form of conference presentations, scientific articles and material published on the web. The project will explore the possibility that funding bodies such as of the **European commission might adopt directives demanding the publication for free on the WWW of all published research papers (for publicly funded research), irrespective of whether they are also published in commercial paper journals**. Such a directive would in fact be no more controversial than the requirement that certain important **sports events** should be televised in the generally available free channels (as opposed to only pay channels).

9.5.7 Wp 7: Assessment and evaluation

B3. Workpackage description

Workpackage number :	7								
Start date or starting event:	project start								
Participant:	**LJU**	SHH	IBRI	ATL	TUW	FGGI	USAL	IND	Sum
Person-months per participant:	1+2	0	1	0,3	2	0	3	4	13,3

Objectives

The objective of this workpackage is to implement internal control of the relevance and quality of the work as well as the fit of the individual components into one coherent whole. The worpackage is also encouraging the links between the process re-engineering workpackages and the technical workpakages and their interdependencies. Assessment and evaluation work is carried out by the partner whose involvement in the tasks being evaluated is minimal.

Description of the work

7.01 Methodology. First the methodologies for the assessment and evaluation are defined so that the evaluation criteria are transparent. A likely candidate for the methodology is the SWOT analysis. A group of external experts - potential clients will be invited to take part in the evaluation.

7.02 A&E of business process re-engineering. The developments in the WP1 are evaluated. Of particular interest are the technical feasibility and the effect on the business models of existing publishers.

7.03 A&E of pilot software. Pilot software will be evaluated from the perspective of the end users as well from the viewpoint of a professional web publisher. These two types of partners do the evaluation in this area.

Related deliverables (see 9.6 for details)

11 Overall assessment and evaluation report

Milestones

None.

9.5.8 Wp 8: Project management

B3. Workpackage description

Workpackage number :	8								
Start date or starting event:	project start								
Participant:	**LJU**	SHH	IBRI	ATL	TUW	FGGI	USAL	IND	Sum
Person-months per participant:	8+2	2	1	0,2	1	1	4	1,3	20,5

Objectives

Project management refers to the process of planning, organising, directing and controlling the integrated effort to efficiently achieve the technical objectives within the constraints of time schedule and budget. The project will be carried out on a concurrent engineering working, which needs to install and maintain appropriate IT infrastructure. The objectives are to:

1. Ensure that the project achieves the scheduled plan.
2. Co-ordination actions among the partners and the EC.
3. Accounting support for the project and payment distribution.

Description of the work

8.01 Overall management, internal Website
8.02 Workpackage management
8.03 Quality assurance, risk management etc.

A detailed description is given in Section 9.8.

Resources are allocated to the project management organisation, workpackage leaders and the quality manager. Web site is created as well as IT infrastructure for collaborative document management, scheduling, text and video conferencing etc.

Personal meetings of the project management bodies are conducted at least four times a year.

Related deliverables (see 9.6 for details)

all; quality assurance in particular influences all the deliverables

Milestones and expected result

In the management workpackage all milestones, tasks and deliverables are monitored.
The expected result is a well-managed project that fulfils the goals that were defined in this document and the expectations of all partners as well as the Commission. It should fulfil the objectives within the given time and within the allocated budget and in a way, which lets the partners concentrate on the research and development work, rather than paperwork.

9.6 DELIVERABLES LIST

Deliverables list[2]

Del. no.	Deliverable name	Delivery at end of month	Lead particip-ant	Estimated person-months	Del. type*	Security**	WP
1	Scientific publishing: as-is business and information model	3	SHH	3.9	R	Pub	1
2	Scientific publishing: to-be business and information model	18	SHH	5.4	R	Pub	1
3	On-line survey software	6	LJU	2.6	P	Pub	1
4	Recommendation, model comparison	24	SHH	15.2	P	Pub	all
5	Content sources and acquisition techniques	9	TUW	5.9	R	Pub	2
6	Initial content architecture	9,18	TUW	6.9	R	Pub	2
7	Initial content engineering/construction	21,24	FGGI	5.9	D	Pub	2
8	Technology: market watch, state of the art and requirements analysis	6	USAL	33.4	D	Pub	1,3,4,5
9	Overall architecture report	9	USAL	20.9	R	Pub	3,4,5
10	Overall implementation report	21	LJU	9.4	R	Pub	3,4,5
11	Overall assessment and evaluation report	24	LJU	13.9	R	Pub	7
12	E-Journal: Infrastructure pilot	24	LJU	5.9	P	Pub	2
13	Core pilot	18	FGGI	9.2	P	Pub	3
14	Intelligent maintenance and use pilot	21	FGGI	9.6	P	Pub	4
15	Wrapper service pilot	21	IBRI	8.8	P	Res	5
16	Dissemination material and website(s)	3, 6, 9, 12, 15, 18	LJU	11.9	P	Pub	6
17	Workshop, event and proceedings	around 18	USAL	4.9	P	Pub	6
18	Promotion, SIG, on-line community	3, 6, 9, 12, 18, 21, 24	TUW	9.9	P	Pub	6

[2] this list is take off an project planning spreadsheet. It will follow the prescribed form in its final version.

19	Dissemination and use plan	6, revised every 6	ATL, IND	8.3	R	Pub	6
20	Final report	24	LJU	9.1	R	Pub	all,6

In addition to the above, internal reports will be created after all work in a task is completed so that the information flows between the tasks uses these internal reports as the media. These reports are all restricted to partner use only.

The following subsections present the brief description of the deliverable.

9.6.1 Scientific publishing: as-is business and information model (SHH)
This document presents the literature study, the as-is models of scientific publishing and the as-is models of electronic publishing on the Internet and the related business models.

9.6.2 Scientific publishing: to-be business and information model (SHH)
Based on the software architecture, initial prototypes, possibilities offered by the technology, the as-is models, user surveys etc. a to-be model is documented.

9.6.3 On-line survey software (LJU)
This is software to implement on-line user surveys on the Web made available as a Web service or open source code, so that scientists from other fields could repeat the surveys and compare the findings with those in SciX.

9.6.4 Recommendation, model comparison (SHH)
This report compares the economies of the as-is and to-be models; it takes into the account the experiences with the prototypes; the surveys, the studies of the barriers to process change (including the legal study) and issues the recommendations for the near future handling of scientific publication process and what individual parties involved (scientists, libraries, funding organisations, commercial publishers) should do.

9.6.5 Content sources and acquisition techniques (TUW)
The report identifies the possible content sources as well as the dissemination targets and the technologies that can be used to gather the addressed content.

9.6.6 Initial content architecture (TUW)
Initial content from the field of architecture is compiled - at least 4000 papers of that 1000 in full text.

9.6.7 Initial content engineering/construction (FGGI)
Initial content from the field of engineering and construction is compiled - at least 1000 papers of that 500 in full text.

9.6.8 Technology: market watch, state of the art and requirements analysis (USAL)
This reports documents the technical base on which the SciX pilot can be developed, reports similar and competitive efforts etc. It also documents the end user requirements.

9.6.9 Overall architecture report (USAL)
This reports documents the software architecture of the pilot system implemented within the SciX project.

9.6.10 Overall implementation report (LJU)
This document presents all the development work done in the project and includes the documentation of the freely available software and services.

9.6.11 Overall assessment and evaluation report (LJU)

Resulting from the assessment and evaluation tasks in WP7, performed by a partner with extensive business experiences in the internet economy, this document will evaluate the work performed by other partners and also give estimates of the after project viability of the solutions. This document will provide a final report as well as documentary evidence of notes that the evaluators gave to the developers during the development work and after seeing the prototypes. Both the results of the technical workpackages as well as of the business process reengineering workpackage will be assessed and evaluated.

9.6.12 E-Journal: Infrastructure pilot (LJU)
Software to implement an on-line, peer reviewed journal and which supports the publication process workflow is created and made available as a Web service or open source software. With minor modifications, this solution is also usefull for conference and workshop organisation.

9.6.13 Core pilot (FGGI)
Software implementing the repository core.

9.6.14 Intelligent maintenance and use pilot (FGGI)
Software implementing the advanced features of the repository.

9.6.15 Wrapper service pilot (IBRI)
Software implementing the value adding wrapper service.

9.6.16 Dissemination material and website(s) (LJU)
An overall graphical design of the project is defined, including logo, document and slide formats, web page layouts etc. A colour brochure for the project is designed and the public website. The content of the brochute and of the website is regularly updated every 3 months. This deliverable focuses on the project - target audience is related to electronic publishing.

9.6.17 Workshop, event and proceedings (USAL)
During the second year of the project, a workshop will be organized. Some of the key persons from the area of electronic publishing will be invited to share their views with the SciX partners and provide some valuable feedback on the project. The outcome of this workshop also feeds into the recommendation deliverable.

9.6.18 Promotion, SIG, on-line community
The project and the resulting software will be actively promoted within the relevant national and international organizations; a special interest group will be formed including a mailing lists and a possible e-newsletter. An on line community of the users of the SciX repository will emerge. This deliverable focuses on the repository. Target audience are engineers and architects.

9.6.19 Dissemination and use plan
The activities described in the deliverables 16-18 will be planned in this dissemination and use plan. It will also include the exploitation plans of the partners, the plans on how to transfer the results to other communities, the life of the results after the end of the project etc.

9.6.20 Final report
This document that will be published as a professionally printed, bound monograph will include the key findings and recommendations of the project.

9.7 PROJECT PLANNING AND TIMETABLE

WP/ Task	Description	3	6	9	12	15	18	21	24
1	**Business process modelling and social-economic analysis**	4	2	2	2	2	3	2	4
1.01	Literature study	1							
1.02	Current and future Web business models and payment systems				1	1	1		
1.03	Formal process/information/business model (as is)	1	1	1					
1.04	Repository and e-journal requirements analysis			1					
1.05	Formal process/information/business model (to be)				1	1	1		
1.06	Comparison of the economies of the as-is and to-be models							1	1
1.07	On-line survey (design and implementation)	2	1						2
1.08	Study of the barriers to process change						1	1	1
2	**Repository content**	4	2	4	1	1	2	2	2
2.01	Analyse content sources in architecture	1	1						
2.02	Analyse content sources in engineering	3	1	3					
2.03	Provide initial content in architecture			1	1	1			
2.04	Provide initial content in engineering						1	1	1
2.05	E-journal infrastructure						1	1	1
3	**Repository core**	4	2	2	1	1	1	0	0
3.01	State of the art study	1							
3.02	Market watch study	1							
3.03	Inception and elaboration	1	1	1					
3.04	Prototype	1	1	1					
3.05	Implementation				1	1	1		
4	**Intelligent maintenance and use**	2	4	1	3	2	1	3	0
4.01	State of the art study	1	2						
4.02	Market watch study	1	2						
4.03	Inception and elaboration			1	2				
4.04	Prototype				1	2			
4.05	Implementation, integration with core						1	3	
5	**Value adding wrapper service**	2	5	2	0	1	2	3	0
5.01	State of the art study	1	2						
5.02	Market watch study	1	2						
5.03	Inception and elaboration		1	1					
5.04	Prototype			1					
5.05	Implementation, integration with core					1	2	3	
6	**Dissemination and Implementation**	7	3	3	4	7	4	5	7
6.01	Exploitation, dissemination and use plan		1		2		1		2
6.02	Website	5	1	1	1	2	1	1	1
6.03	Project presentation materials	1		1		1		1	
6.04	Workshop					3	1	1	
6.05	Establishing of Target user group, promotion	1	1	1	1	1	1	1	1
6.06	Final report / publication							1	3
7	**Assesment and evaluation**	1	1	1	0	0	0	2	2
7.01	Methodology	1	1	1					
7.02	A&E of business process reingeneering							1	1
7.03	A&E of pilot software							1	1
8	**Project management**	3	3	3	3	3	3	3	5
8.01	Overall management, internal Website	1	1	1	1	1	1	1	2
8.02	Workpackage management	1	1	1	1	1	1	1	1
8.03	Quality assurance, risk management etc.	1	1	1	1	1	1	1	2

9.8 PROJECT MANAGEMENT

The partners in SciX are not new to the management of large EU projects or the organisation of international research. The partners with the most experience in similar projects will take a leading role in managing this one.

The organisation of the SciX project management covers structural, technical and organisational issues. It separates project co-ordination work, technical management and catalysing work. It also distinguishes between decision-making structures and organisation of daily operations. Project administration coherence is provided by a top-down organisation of co-ordination and by direct involvement of the **board** that has both technical and management functions. Technical co-ordination is organised in a bottom-up fashion to ensure flexibility and fast decision making in technical issues. A quality system for research and development projects with prescriptions for reporting, quality assurance and project manual will be adapted to serve as a basis for the corresponding activities in SciX.

9.9 MANAGEMENT STRUCTURE

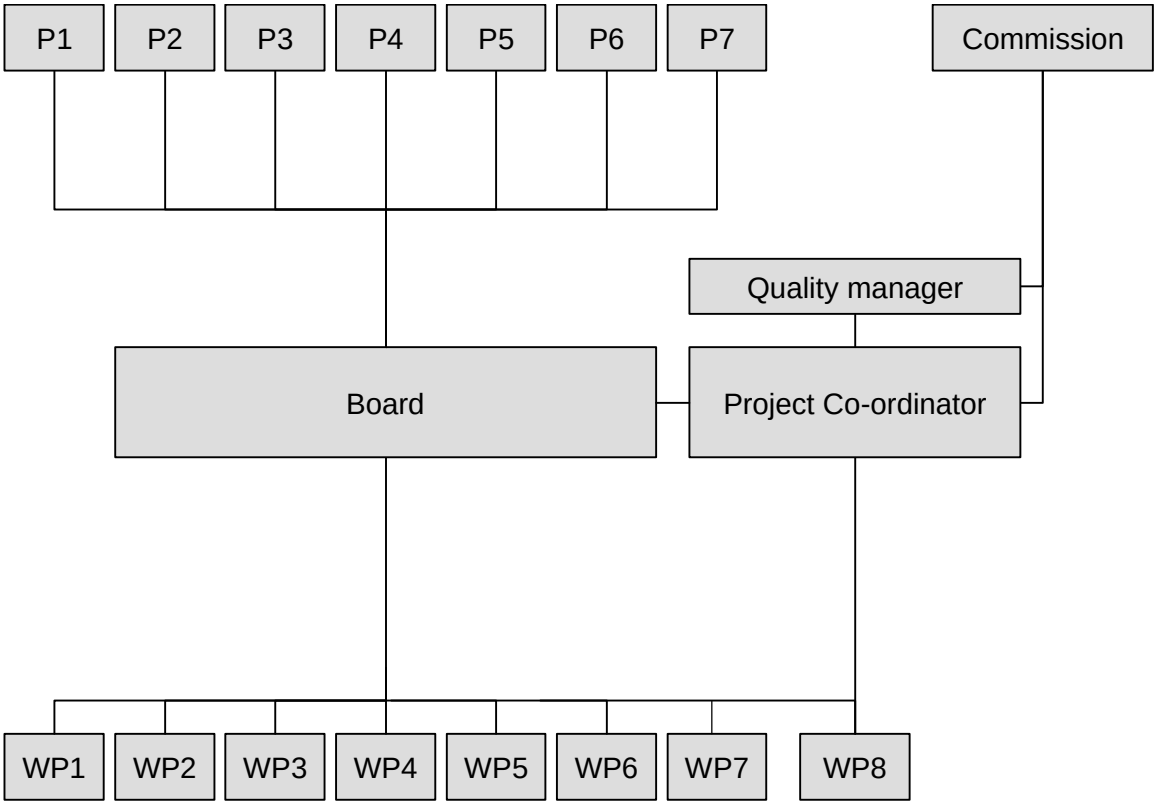

Figure 7: Project management structure bringing together partners (P) and workpackages (WP).

The management structure proposed for SciX aims at facilitating co-operation between partners while maintaining a strict control of gradual achievements of project objectives. The following project organs are defined:

Board. The board is responsible for the execution of the project and is the final authority for project-related decisions. It is responsible for the legal, financial and operational matters associated with the execution of the project in accordance with the commission contract. It is also responsible for initiating and co-ordinating any activities related to quality control of the deliverables. Meetings of the board are arranged regularly to control the project and review the objectives, the work plan and other strategic aspects of the project. The board is also in charge of the technical development of the project. The project coordinator is responsible for the technical development of the project. This includes the management of

dependencies between various tasks, co-ordination of technical progress, review and approval of technical reports and deliverables, and resolution of problems of technical and administrative nature.

The board is composed of the nominated partner representatives, one per partner, called the Partner Representatives. The board meets three times a year or more often if requested by one of the board members.

The **Project Co-ordinator** is responsible for implementing the decisions of the management board and tracking the progress of the project. He supervises the project administration, responding to important changes during the project life and co-ordinating necessary adaptation to meet conditions of external environment. He is in charge of dealing with the contract, work plan, reporting and billing of efforts, budget and review organisation, and assumes the responsibility of representing the project in front of the Commission.

The **Quality Manager** is in charge of installing and monitoring the quality procedures, related to software development and documentation of the results. At this point the partners believe that the **exploitation manager** is not required, because each partner has a fairly independent future exploitation path.

9.10 MANAGEMENT PROCEDURES

Quality assurance. The project will operate within certain administrative procedures, which will be defined at a very early stage covering management reporting, document standards, collaborative specification and development, review, configuration, change control and quality assurance. The quality reviewing functions are important to make sure that all contributions and conclusions are consistent to meet the requirements of the deliverables. A common format will have to be agreed upon for the preparation of all documentation and the deliverables.

Conflict Resolution Procedures. Should the members of any board fail to reach an agreement on matters of substance the conflict will be solved by voting so that each partner in the project has one vote. Decisions can be made if majority of the partners is present. If the disagreement appears among several members of the same partner, the Partner Representative must define the official position of the partner. If the Partner Representative either does not decide or is missing and the other members of the partner do not reach a common position, the partner's vote is considered as abstention. In case of a tied vote the project coordinator has a casting vote.

Consortium agreement: The consortium will define these procedures as well as other internal relations, IPR etc. in the consortium agreement during the first three months of the project.

9.11 MANAGEMENT INFRASTRUCTURE

Intra-project: The co-ordinating partner will set up Web based infrastructure for intra-project collaboration which will include document management system, conferencing and email lists, shared calendar as well as real time communication channels such as video-conferencing and ICQ.

Communication within the consortium. E-Mail and the World-Wide-Web will be used as the main communication tools for internal communication and document exchange The meetings mentioned above will be held to tackle discussions on important issues that require the participation and opinion of all partners. This is also an opportunity for partners to meet in small workshops in order to solve small problems, doubts and requests not concerning the whole project.

10. Clustering

The project will take part in relevant IST activities, conferences, promotion days etc. It will seek for contacts within the KA3 ofteh IST programme, in particular from the following themes:

- Public access to information
- Digital Libraries
- Knowledge information chains
- Business models
- Metadata and
- Distance learning

The project will also be looking at KA2 programmes from the filed of AEC (architecture/engineering/construction) in order to promote the SciX platform for the publication of their results.

11. Other contractual conditions

11.1 SUBCONTRACTING

- The legal study will be subcontract unless a researcher with some legal background is hired in Salford or at Hanken.
- SHH will subcontract some process modeling experts.
- TUW and LJU will subcontract some of the content gathering (imaging) operations to a specialized imaging company.

11.2 TRAVEL OUTSIDE EU MEMBER AND ASSOCIATED MEMBER STATES

Academic members of the consortium, particularly LJU, SHH and TUW will travel to the US, South America and Austral-Asia to report on the project at peer reviewed international conferences and to set up agreements with the international and local (continental) associations of scientists from the field of architecture/engineering/construction for the influx of content into the repository. Annual conferences of organizations such as CIB and IABSE will need to be visited. Examples of continental organizations that should be informed and contacted include ASCE (American Society of Civil Engineers), ACADIA, CADRIA, SIGRADI etc. organizations.

11.3 OTHER SPECIFIC COSTS

A workshop on electronic publishing in engineering will be organized in spring/summer 2003 - most likely in the UK. Some costs of organizing this workshop and for the reimbursement of the travel costs to some key attendees and keynote speakers is provided in the budget of the coordinator.

Some funds are set aside for the hardcopy publishing of the final report.

12. (Optional) Supplementary reports and concertation activity: Other action-specific conditions

This section has no content.

13. Other considerations

This section has no content.