Internet publishing case study: ULIX and EDUCATE

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Introduction

This paper describes the contents and methodology of two electronic publishing projects currently in progress at the University of Limerick. The first of these is ULIX an information exchange service and the second case study is EDUCATE, a training project directed toward education and training in the use of information resources. Following an introduction to each project the paper will outline the work practices, team organisation, technical aspects and user trials. Some general observations will follow on issues relating to electronic publishing. In conclusion, the benefits, problems and future of both projects will be considered.

ULIX

ULIX (University of Limerick Information eXchange) is an electronic information exchange or publishing mechanism known as a CWIS or Campus Wide Information System.

These systems are defined as "a means of disseminating information electronically to the people within a single institution" (UCISA:1995). It is primarily a communication mechanism that acts as an access point to documents available via the world wide web and as a means of publishing by and to the local community and to the world. It also serves as an Internet on-ramp, particularly for non-computing faculty, staff and students.
The homepage offers users an initial menu of seven categories. Local information is organised into four categories covering general information, academic and research information, information concerning administration and services, and leisure information. Some pages are only available to internal users or are limited to a specific user group by password control. There is a detailed section dealing with accessing Internet resources that includes links to local and national servers. The final two categories, which are currently under construction, deal with local search tools and information about ULIX.

As an electronic publishing service ULIX aims to publish a full range of University documents. We are focusing on obtaining those documents which users will find most useful and which may not be easily available in print format. Access to academic and administrative services and to minutes of meetings, reports and policy documents is identified as a priority. ULIX enhances access to such information and allows services to be accessed by greater numbers of users, at whatever time they choose.

Awareness is growing rapidly throughout the organisation of the value of ULIX as a promotional and pre-print mechanism for research and consultancy. We are encouraging faculty and staff to use personal homepages to publish research results, papers and research profiles. Community information, covering everything from accommodation to sports facilities, is provided for the use of all groups on campus.

One section of ULIX provides a structured access point to the vast range of documents available on the Internet. Within this section we are aiming to provide a guide to sources and search tools that is designed to suit the requirements of our clients. We provide a selection of catalogues, search engines and lists of sites considered useful and sites specially selected by University Librarians. A selection that has proved particularly useful is links to other servers on campus and to Irish servers as they provide quick routes to sites visited regularly. In addition to the structured lists we include links to random URL’s, topical sites and to newspapers and current affairs magazines to include an element of browsing and serendipity. We have found this
section of ULIX particularly useful in training sessions as it provides a controlled introduction to the resources of the Internet.

ULIX is designed to co-ordinate information originating from a campus-wide range of information providers. It is envisaged that after training these information providers will maintain particular sections of the ULIX server. The server is divided into college and departmental units and information providers will take responsibility for their specific area. Information providers will be supported with initial training sessions and regular follow-up meetings. They in turn will provide access for individuals to set up their personal homepages. To support the spread of personal homepage creation, faculty and staff will be offered basic HTML training. Of course these information providers are also users of ULIX and their input as users, and direct day to day contact with other users, is particularly useful. This dual role, and a strategic spread of information providers throughout the University, should ensure that the information on ULIX is useful and used. ULIX is a dynamic product and we are organising it so that it can grow and develop as directed by the needs of its users and the University.

EDUCATE

EDUCATE (EnD-User Courses in Information Access through Communication Technology) is a CEC Libraries Programme project that aims to produce a self-paced user education course in the selection and use of information sources.

The project has a special focus to deal with on-line information sources and a special feature of the project is the inclusion of real time on-line demonstrations and exercises. EDUCATE deals with the subject areas of Physics and Electrical and Electronic Engineering. The partners in the project are:

Chalmers University of Technology, Imperial College of Science and Technology, Ecole Nationale des Ponts et Chaussées, University of Plymouth, University of Barcelona and the University of Limerick.
A specific objective is the production of a user education course that is self-paced and based on digital communication networks. The EDUCATE course guides users through the various sources of information in Physics and Engineering in a self-paced manner with extensive use of hypertext links. However of equal importance are the sections of the course dealing with scientific communication, the search process, keeping up-to-date and the organisation of results. An additional feature is the inclusion of an EDUCATE Newsletter which provides the latest information on the project. It is envisaged that though the course would cover the subjects specified it could be used as a model for user education programmes in other subject areas.

The work packages dealing with the management of the project and the writing of texts for the course are the responsibility of Chalmers University of Technology. Work on the demonstrations and exercises is carried out by Imperial College of Science and Technology. The on-line demonstrations guide users through various search procedures and eventually links them directly to the on-line source. These demonstrations include an introduction and access to the Internet. The task of translating the course text and demonstrations into a hypertext document is the work package assigned to the University of Limerick. This involves building the user interface, that is the front-end or menu structure, for the EDUCATE course. Much of this work is now well underway and subsequent work packages dealing with evaluation, satellite feasibility, translation and training will occur at a later stage.

The EDUCATE work package assigned to the University of Limerick has many similarities with the ULIX project and both projects benefit from each other. The conclusions and observations that follow are drawn from my experience of working on both projects.
Working arrangements and practices

The initial objectives of ULIX were:
To draw together information circulating to students and staff in all formats into a co-ordinated electronic information service, to give access to remote services and to provide the external community with access to relevant University of Limerick documents. A multidisciplinary and multiskilled team was put in place to realise these objectives.

We began by carrying out a survey of potential users of the service to ascertain what categories of information they required. This survey revealed a strong demand for a wide variety of information, ranging from bus timetables to visitor information and class lists. There was considerable interest in, and approval of, a central easy-to-use information source for all types of information pertaining to the university. At this time, team members also reviewed the literature and homepages on the web, with particular attention paid to group discussion during which we reviewed and ranked CWIS and other homepages.

We approached the initial prototype from two opposing directions. The first was a top-down approach with attempts to create a menu structure or subject tree, radiating from a homepage menu of up to ten headings. The second approach was bottom-up where we attempted to group information items into appropriate categories until we reached the same homepage set of headings. This work continued during the summer of 1994 and the homepage, with seven headings, and the pages at the two levels immediately beneath each heading, gradually emerged by consensus. Much of this work was done with the use of flip charts and pin boards and the transfer to screen was often a difficult experience. In this way team members slowly began to realise the difference between creating documents and structuring information for screen and hypertext viewing and that of writing for print-based media. As we began to build up these new skills and became more adept at creating documents on screen these difficulties diminished and our productivity improved.
In tandem with the organisation of homepage structure, work proceeded on the page design. Initial design proposals were tempered and amended following on-screen viewing. Our design decisions were constrained for much of the time by technical problems that we are only now beginning to resolve. The design process continues in a review and redraw cycle and we hope to finalise work on this by September 1995. Once a prototype subject structure and design was created, we set about obtaining information in electronic format where possible. This stage was quite time-consuming in that it involved detailed explanation about the Internet, browsers, electronic documents and demonstrations of the prototype. It was only when people were comfortable with the product that information was made available. Once data was loaded, information providers were encouraged to return to view it on screen. This often resulted in the restructuring, editing or rewriting of documents.

When the prototype was at a reasonable stage of development and some information was in place for many subject categories, it was reviewed by the corporate affairs department and deemed to be in keeping with the publication guidelines of the University. ULIX was subsequently launched by the President of the University and this official sanction was very useful in persuading information holders to become involved with the ULIX service. Work on EDUCATE did not deal with the same content issues or the very detailed information structure required for ULIX. It was also useful that EDUCATE had a later start date than ULIX; by the time we began to work on EDUCATE we had learned a lot from the ULIX experience. Basic skills in HTML and good document structuring and design had been acquired. Thus the EDUCATE package allowed us to concentrate on issues relating to navigating and moving through the document, and the incorporation of demonstrations and real-time sessions in the training programme.
Team organisation

Both projects are initiatives of the Information Systems and Services Division. The Division Director selected two groups to work on these projects. The teams reported to and liaised with the Director and a management group comprising the Director: Information Systems and Services, the Manager: Library and Information Services and the Manager: Information Technology Department. It is significant that the tasks and projects themselves demanded a wide range of skills and the co-operative endeavour of a variety of departments. One of the most interesting and beneficial aspects of these publishing ventures was working in such multidisciplinary and multinational teams. The ULIX team* has members from the computing and library areas but also a graphic designer, human-computer interface researchers and an educational technologist. The involvement of a faculty member and postgraduate student added a very beneficial research dimension to the team.

An Editor and Editorial Assistant were appointed at an early stage to progress work on ULIX and co-ordinate the work of the team.

Team meetings are conducted in an informal manner and short notes of the meeting are kept. Liaison with the management group is achieved by reports from the editor to the management group and joint management team meetings which occur from time to time. Individual team members take responsibility and carry out tasks agreed at meetings autonomously. The editor’s role in liaising with team members on an individual basis was extensive.

A good team spirit has developed and individuals are able to call on the skills of other team members as needed.

The EDUCATE work group was smaller but was closely linked to the ULIX team. The transfer of experiences and skills between project teams was facilitated by some staff members serving on both teams. The EDUCATE work group at the University of Limerick worked closely with representatives from the other project partners.
Technical aspects

The technology selected to deliver these two products is the World Wide Web. Initially a Mosaic browser was used to view documents but was replaced by Netscape early in 1995. Each document is marked up using HTML (Hypertext Mark Up Language) to make it accessible. We were conscious that the products would be viewed by a range of browsers and tailored our documents so that they would look reasonably well on a number of browsers rather than to best advantage on Netscape. It is also significant that individuals can configure their machines with personally selected colours and fonts. As the products were to be easily accessed from sites around the world we sought to maximise transmission speed.

Our reviews of other CWIS and homepages convinced us that the use of images, video and sound at many sites added little to the value of the product and that the delay in access that this caused was off-putting. Therefore initially little use was made of graphic items due to concern with time taken to access the documents. However feedback on design was negative so the use of small icons that can be loaded quickly was agreed.

We are also exploring the use of thumbnail images which would allow users to click to view full image if they wished. A set of navigational icons representing the main homepage categories will be used as an aid to quick navigation through the documents. A dedicated sun server and NCSA HTTPD software are used to support both projects. Set up of the server took a number of hours and server maintenance is provided by the Information Technology Department on an ongoing basis. User logging, and designed and scripted forms are in place on ULIX.

This facilitates user feedback and helps us provide a more responsive service. Currently research is on-going on selecting software for automatic indexing and validation of documents, verification signatures for information providers and automatic update or expiry notices.
User trials

A series of usability tests on ULIX were used and continue to be used to improve the service. A formal survey of users is in progress. This is carried out by inserting a survey form on the homepage and including all respondents in a draw for a small prize. The response rate is high and results will be available in July 1995. Video trials of sample users was carried out. This involved videoing participants using ULIX, including sound recordings of their ideas and responses as they talked through their choices. Participants were given specific tasks to accomplish in some sessions and in others were allowed to browse and select their own routes. Presentations of ULIX to individuals and groups also generated feedback. We included links to the editor from many pages and this encouraged on-the-spot responses from users.

All the responses gathered through formal and informal methods are used to improve ULIX. They have helped us to identify those sections which were difficult to navigate, headings that were obscure, pages that required more information and to relocate sections that were buried too deeply. Most responses were positive and encouraged us to continue work on the project.

Issues relating to electronic publishing

The EDUCATE and the ULIX projects are similar in that they are both fundamentally experiments in electronic publishing.

From our experience it is clear that the new Internet technologies have opened up opportunities for the production of documents and the delivery of services. However they also require new skills, new skill sets, new working relationships, new methods and new techniques. Working on these projects has allowed us to identify some of the issues, relating to using the Internet as a publishing mechanism.

One of the most fundamental lessons we learned was the identification of the parallels and differences between publishing on screen and in print formats. Clients use the two
media in different ways: for example, while most people will scan pages they are less likely to scroll through long documents on screen and need more access routes. Users may not be comfortable reading from the screen over long periods so it may be a good idea to offer the facility to print documents in script or word format, as well as using the document in hypertext mode. However there are striking similarities between electronic and print-based publishing in the roles of editor, editorial board and information provider or reporter.

Information structuring and management require considerable effort and are a major aspect in electronic publishing. When publishing a particular body of information you need to organise it into an appropriate structure as in chapter headings in a book, or a tree structure. At this stage it is important to consider how your users will approach the subject and what structure they would find most useful. Novice users often feel most comfortable with a clear structure that follows closely that of the knowledge itself. More experienced users may already have conceptualised their own structure and will find any deviations from it difficult to handle. In this case you may need to create a more flexible structure with multiple access points and provide quick routes through the document. This allows experienced users to follow their preferred route. If you are writing for a mixed group you may need to provide for both options and include a short explanatory description to accompany each link. Such a structure will be more complex, with various options folded into the document as appropriate.

Structuring information usually follows a menu or bullet format and, as a rule, the fewer items on a menu the more menus or steps needed. However, long menus require a lot of scrolling which users find unacceptable. A balance needs to be struck between the length of the menus and the number of links needed to get to a particular document. It is recommended that between five and nine headings per menu are used.

The arrangement and naming of these headings are important considerations. When writing documents for electronic publishing it is useful to think in terms of creating a series of small units or building-bricks of information. It may also be worth remembering that you may want to re-use some of these units for other purposes. The linking or sequencing of these units is a second stage in document creation. One of the
The benefits of hypertext is that, although you may write a unit of information once, you may link to it many times. Of course you may also link to units of information in other documents, your own or those of other authors.

The creation of documents for hypertext formats is a process of weaving units of information in a variety of structures as appropriate to your readers' needs. This allows them to read or view your documents in an individual manner, selecting their own routes through the documents.

In addition to structuring the information you also need to consider elements of style. Some style standards or customs are emerging and they make creating hypertext documents less daunting, by providing basic guidelines. The first page on any collection of documents is known as the homepage. It provides an introduction to the overall structure to the documents with links to the main units. It may also provide links to related documents or sites. General guidelines include avoiding fancy or embellished formats or fonts, not using more than two formats per screen, signing and dating all documents and providing a welcome page for outsiders or new users. As you cannot regulate at what point readers will enter your document it is useful to put some context details onto your headings e.g. "Introduction to Astro Physics" rather than just "Introduction" on its own. In addition navigational keys or buttons at the top or bottom of each page are necessary. It is preferable to make hypertext links readable statements or phrases rather than using "click here".

There are no strict guidelines for document size other than a range of half to five A4 pages. As long as documents have a well-defined concept and contents type menus to speed navigation-size is less important. Do not assume that users will scroll down through documents; it may be better to split them into sub documents and provide navigational aids.

Working with information providers to bring them to an understanding of hypertext document creation is a slow process. It is difficult for authors to adjust to new styles of document creation and they need support in this process.
Sometimes suggested structural amendments that would make the document more useful are perceived as criticisms of the content. Authors should be encouraged to view their document on screen with the editor as part of the writing process until they build up appropriate skills. It is most useful for all concerned to adopt an iterative approach to document creation.

Lessons, difficulties and what next

These case studies in electronic publishing have brought many benefits to the participants. They have stimulated and facilitated our confidence with, and mastery of, Internet and hypertext technologies. We have participated not only as users or brokers of information but also as creators and publishers. We have also enhanced our end-user training and presentation methodologies. An additional benefit is the experience of international co-operation, knowledge transfer and the development of relationships between participants. The projects have provided a good opportunity for Library and Computing staff to work together outside the regular organisation structure. This has given each group greater understanding of the others’ ideas, views, constraints, contributions and work practices.

It has allowed library staff to increase the confidence and ease with which they work on technical issues and to become more aware of the value of their contribution.

Of course the overall benefits of the projects are the products themselves. ULIX is proving a useful information mechanism for the University, its students, faculty and staff. The best indication of its benefit is that it is being used and is considered useful. EDUCATE is of use in its own right as a training programme for Physics and Electronic and Electrical Engineering. It will also serve as a model that could be easily amended to suit other subject areas and specialist user groups.
During the course of these projects we also encountered some difficulties. At the early stages of the work we were slow to grasp the potential of the technologies, for example, thinking in terms of linear structures and documents rather than document weaving. Initially we did not perceive the value of graphic elements in enhancing documents and navigation.

The rapid phase of technological development during the period of our work caused us some difficulties.

On a number of occasions we made decisions based on technical constraints. These constraints were resolved shortly afterwards forcing us to re-examine issues, redesign pages and restructure information. It should be noted that there were few or no articles or books that dealt with the organisation of CWIS or HTML publishing at the level of detail we needed when we began this work.

A constant concern of some team members was that we were not using the technologies to their best advantage. At this stage we are closer to realising this and are working to use the technology to maximum benefit.

Neither project is near completion and this outline is a snap-shot at a particular stage of development. ULIX is moving into a marketing and training phase so that the service is embedded into the University structure and operates using a network of local information providers and personal homepages. This involves a HTML training programme and the creation of supporting policy and advisory documents. Work is well underway on a redesign of the ULIX banner and graphic elements and a new design will be released for the new academic year.

EDUCATE is at the start of the second in a three year cycle. A new structure is under consideration at present and work remains to be done before completion of this work package.
Conclusion

On reflection involvement in these projects is an exciting, interesting and demanding experience.

We had to learn a new set of skills and to forge new working relationships. However, we can perceive many uses for this knowledge. We are interested in using the skills developed to date and continuing to stay abreast of the technology by exploring other electronic publishing ventures.

Team members are Patricia O’Donnell (Library), Tom Maher (Computing), Dave Lilburn (Graphic Artist), Liam Bannon (Faculty, Human Computer Interaction), Mairead Waters (Library), Bob Struntz (Education Technology), Harald Weinreich (HCI Postgraduate student), and Gobnait O’Riordan (Library).

Abbreviations

CWIS Community (or Campus) Wide Information System
EDUCATE EnD User Courses in information Access through Communication Technology
HTML Hyper Text Mark up Language
HTTPD Hyper Text Transfer Protocol
NSCA National Centre for Supercomputing Applications
ULIX University of Limerick Information eXchange
URL Uniform Resource Locator
References


