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Using Iolis Authoring Techniques In A Web Environment

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Abstract

Recently, there has been an increasing focus on the acquisition of research skills by law undergraduates. One reason for this interest is a belief that many such students do not acquire an adequate level of research skills by the time that they graduate. Reflecting this concern, both the Law Society/Bar Council's *Joint Statement on Qualifying Law Degrees* and the Quality Assurance Agency's *Benchmark Standards for Law* both place great emphasis on the need to improve research skills teaching at University level. In the light of these developments, Durham University's Centre for Law & Computing decided to develop an *Iolis* style courseware package on legal research skills.

Rather than use traditional law courseware authoring tools, however, the Centre chose to experiment by attempting from the outset to develop the package as a prototype website comprising text integrated with interactions. If successful, such an approach could have the benefits of making a workbook that is: (i) accessible across the Internet or a campus intranet; (ii) customisable to the needs of individual law schools; (iii) flexible enough to reflect more of the author's own approach and style; and (iv) interconnectable more readily with other campus websites and with the world wide web at large.

1. Introduction

1.1. Durham's Background

Durham University's Centre for Law & Computing has long been interested in the application of information and communications technology (ICT) to legal education. This interest has expressed itself in work on e.g. computer simulation[1], electronic law tutorials[2] and the futurology of legal education[3]. The greatest focus however has been on the development of interactive learning packages in general and *Iolis* in particular.[4] In relation to *Iolis*, the Centre was one of the original sponsors of the Law Courseware Consortium (LCC)[5] - which celebrates its tenth birthday this year. Also, a representative served for many years on the management committee of the LCC. In addition, a member of the Centre played a part in the initial design of *Iolis* and led the first team of authors - the contract law team - ultimately creating half the total number of contract workbooks as well as a workbook on communication skills.

1.2. Legal Research Skills

Recently, there has been an increasing focus on the acquisition of research skills by law undergraduates. One reason for this interest is a belief that many such students do not acquire an adequate level of research skills by the time that they graduate. Reflecting this concern, both the Law Society/Bar Council's *Joint Statement on Qualifying Law Degrees*[6] and the Quality Assurance

Agency's *Benchmark Standards for Law*[7] both place great emphasis on the need to improve research skills teaching at University level.

No doubt like law schools generally, the curriculum at Durham is very full. In particular, there is very little scope for extra contact time apart from a small number of extra lectures on legal research skills. With this limitation in mind, Durham's Centre for Law & Computing decided to develop an education package on legal research skills to be used in conjunction with the short lecture course at Durham and possibly more widely. Our existing interest in - and experience of - developing *Iolis* style courseware led us to conclude that such an approach might well provide a suitable medium for the self-paced learning package on research skills made up of pages of integrated text and interactions.

1.3. An Iolis/Web Prototype?

One obvious way of developing an *Iolis* style package on research skills would be to use *Iolis Author* itself. However, there were a number of reasons why it was decided to take an alternative route. Firstly, the power and the potential of the world wide web (the web) must surely demand a complete rethink of the way in which ICT is deployed in legal education.[8] Nothing is sacred any more - not even well-trying and successful packages such as *Iolis*! Secondly, the LCC itself has plans to move *Iolis* onto a web platform in due course. Thirdly, as acquisition of legal research skills now requires as much familiarity with web-based sources and search tools as with print sources and search tools, development of a web-based package seemed to provide the potential for an interesting range of educational developments. Finally, *Iolis Author* has been out of action since Autumn 2001. *Iolis* has been converted to a 32-bit format and the authoring tool has not yet been upgraded to work in conjunction with the new version. For these reasons, the Centre concluded that it would be useful to build an *Iolis* style workbook in a web environment from scratch in order to explore the strengths and weaknesses of such fusion.

2. The Issue

2.1. Iolis

The Law Courseware Consortium developed, maintains and delivers *Iolis*. *Iolis* comprises a collection of workbooks and a resource book. The workbooks, which are multimedia in nature, present the student with pages of self-paced learning materials comprising text and interactions. These interactions are not just offered as detached quizzes and tests - i.e. 'questions asked to test'. More importantly, they are actually embedded in the text at appropriate points in order to help students engage more fully with the text - i.e. 'questions asked to teach'. The resource book, which is directly accessible from the workbooks or can operate in freestanding mode, contains a large collection of primary sources together with a rather smaller number of secondary sources.

What are the strengths of *Iolis*? The pedagogic approach of using pages of integrated text and interactions has proved to be more engaging and challenging than mere text, although less so than human interaction in e.g. tutorials. As for the workbooks, there are over one hundred of them covering fourteen mainstream legal subjects. Authors who are academic specialists in the relevant field have written all these workbooks. The associated resource book has grown until it now contains several thousand case reports, pieces of legislation and articles, all in full-text form. This means that the student has access to a powerful online library while using the *Iolis* workbooks and can, indeed, bring up on screen the majority of the sources cited and discussed in the workbooks by clicking on to appropriate hyperlinks. The general look and feel of *Iolis* is widely regarded as attractive and easy to use, and with some modifications, it has stood the test of time quite well.

What, then, are the weaknesses of *Iolis*? Born into a pre-web world, *Iolis* now lacks many of the features that web users regard as standard. *Iolis* is not accessible - i.e. does not run - across the web.

Although e.g. revised workbooks are sometimes delivered via the web, updating and upgrading is not a constant feature as it is with many websites. It takes place twice a year when a new CDROM arrives through the post. Although it was originally envisaged that Iolis would be customisable, allowing for a great deal of adaptation by law schools to fit their individual approaches, this feature has never been implemented beyond providing a limited annotation facility.[9] Ten years ago, the level of authoring expertise was so low that a handholding, heavily standardised authoring tool was undoubtedly the only way forward. Today, when it is common for academics to develop their own websites, many would probably appreciate greater freedom to develop workbooks that reflected more of their own approach and style. Iolis does not exhibit the huge degree of interconnectivity is a prime characteristic of the age of the web. While clearly an important location in its own right, it does not function well as a gateway to other campus websites and to the web at large.

2.2. The Web

The web is the principal publishing arm of the Internet. It is based on the notion of massive interconnectivity where every location is simultaneously capable of being a gateway to the rest of the web. The web is an access-orientated multimedia technology built on the awesome power of hyperlinking. The idea of the web has caught on in the developed world in a similar way to – and to a similar extent as – other universally used communication/content media such as the telephone, the radio, and television. Where it differs, however, is that it has caught on at an enormously faster rate than any of these other media.

One of the strengths of the web is its huge popularity as a medium. It is estimated that there are currently nearly 37 million servers connected to the web.[10] Usage of the web is no longer measured in terms of thousand or millions of users, but in percentages of national populations. As a result, the look, feel and functionality of webpages and the browsers that display them have become a powerful informational paradigm. Post-web operating systems and applications – if they have not already migrated to the web – often mimic some or all of the features of pages and browsers. Another strength is that webpages and sites are often highly customisable by users. Not only can features such as backgrounds, fonts and colours be altered by users, but, more importantly, individual pages can be selected from different websites, mixed, matched and presented in ways that are dictated by individual users rather than by the authors.

Turning to the weaknesses of the web, its success has also, to some extent, been its weakness. Being so massive, it can be difficult to find useful materials. Much-vaunted search engines are now of declining value as they index smaller and smaller proportions of an expanding web. Furthermore, they lack the sophistication to deal adequately with the typically poor ‘signal to noise’ ratio that one often associates with the use of search engines. Human-made web directories, although improving the signal to noise ratio, have struggled to keep up – and to keep up-to-date – with the web from the very start. Another problem is that, so far, the web has tended to evolve as a generalist medium. As such, it has not always been well adapted to specific uses. As we shall see, the development of the medium for interactive learning purposes has been relatively unsophisticated, so far. Yet another problem is that, from a developers’ point of view, although there are a limited number of popular browsers, many different versions of those popular browsers are still in use. This, coupled with the ability of users to change many of the aspects of the display of each webpage, may contribute to a ‘dumbing down’ of web materials to ensure maximum accessibility.

2.3. Models of Convergence

Given that both *Iolis* and the web display strengths and weaknesses, is it possible to converge the two technologies in such a way that the strengths of both are preserved while the weaknesses are diminished? To explore this question, let us identify and describe a number of models that exhibit varying degrees of convergence. Here, four models have been identified. They are as follows:

A. The Echo Model: This model involves gradually developing *Iolis's* interface to maintain a superficial resemblance to the look, feel and functionality of web browsers and websites. This model is the easiest to achieve and, indeed, the LCC has been using it for some years. As a result of this model, the *Iolis* interface has some resemblance to a web browser. Authors can now create links to particular websites in the text of their pages, and law schools can set up a collection of links to websites accessible from the toolbar. Appearances are deceptive, however. *Iolis* still lacks most of the functionality of a web browser and the degree of customisability that a true website would possess. Furthermore, as we have seen, it does not exhibit the level of interconnectivity that would enable it simultaneously to be a location in its own right and a gateway both to other campus websites and to the web at large. A particular problem with this echo model is that superficial resemblance masks the fact that, beneath the surface, *Iolis* technology is tending to slip ever further behind faster-moving web technologies.

B. The Nesting Model: Such a model involves embedding *Iolis's* existing, non-web workbooks within a website to create an enhanced learning environment. Work in this area has been done at Coventry University's School of International Studies and Law and has led to the development of a system called *IolisPlus*. This package seeks to supplement existing *Iolis* workbooks by providing, among other things annotations & comments, extra questions designed to promote deeper learning of some of the matters raised by *Iolis*, additional materials of a more contextual nature, and an online discussion forum.^[11] While this work is both interesting and useful, perhaps its most valuable contribution is to highlight the relatively unsatisfactory situation that we are currently in, and the pressing need for a fuller degree of convergence.

C. The Conversion Model: This model involves enhancing *Iolis* by enabling it to convert its existing non-web pages into webpages. Interestingly, *CALI Author* developed by the Center for Computer-Assisted Legal Instruction (US CALI) already possesses this capability. It came about as a result of merging a prototype web authoring tool called *Webolis*^[12] with an existing *Iolis*-based authoring tool. Many of the workbooks created using *CALI Author* are now available either in traditional non-web form, or as websites. Adding a conversion facility would enable the LCC (or perhaps individual workbook authors) to convert existing *Iolis* workbooks into a web format. Once converted, such workbooks can, of course, be made accessible over the web. Webpages that are produced by such conversion, though, are inevitably mirrors of their original non-web format. While the look, feel and functionality of such workbooks is similar to other websites, there is also an obvious rigidity to such converted materials derived from their origins. It can be argued that the conversion model does not make optimum use of the web.

D. The Fusion Model: What would *Iolis* have been like if it had been devised and developed just after the coming of the web rather than just before? Basically, this model is concerned to answer that question. It involves distilling concepts and techniques from the existing *Iolis* technology, and applying them from the outset in a web environment. If successful, such an approach might be the best way to bring law courseware into the mainstream of the web paradigm. *Iolis* would no longer just look like a little like a website, or be embedded in a website, or be a restricted web version of *Iolis*. The two separate technologies would have been fully converged. The result of that convergence could have all the features that we would want *Iolis* now to exhibit. One immediate problem with the fusion model, though, is that a completely new *Iolis* authoring tool would need to be developed to operate in conjunction with an existing web authoring tool such as Macromedia's *Dreamweaver 4*. Even more onerous, all the existing workbooks would virtually have to be rewritten. This is a massive undertaking, and might take a great deal of time and money if it were done at all.

3. The Project

3.1. Project Basics

The project undertaken by the Centre had the following goals:

To build a useful research skills package

To develop a web-based prototype using Iolis authoring techniques

To explore the fusion model of convergence.

Achievement of these goals involved selecting a suitable development tool and then using that tool to build the prototype. The intention then was to evaluate the prototype to determine not only its effectiveness as a research skills package but also what could be learned about using Iolis authoring techniques in a web environment.

The Centre obtained a grant from the City Solicitors' Educational Trust to undertake the project. The funds were mostly used to pay for replacement teaching costs so that an existing member of staff could undertake the development work. The remainder of the grant was used e.g. to buy appropriate software development tools and books. The developer who undertook the project work – the author of this paper – already had a background in designing and authoring Iolis workbooks coupled with some existing experience of developing websites. It was decided that the duration of the project would be one year starting on 1 October 2001.

3.2. Choice of Tools

One of the earliest tasks to be undertaken was identifying and acquiring suitable software development tools. The developer began by considering the capabilities of US CALI's *CALI Author* package. *CALI Author* is derived from *Iolis Author* and so is in many ways very similar. It supports the development of pages of integrated text and interactions. Furthermore, its range of interactions is at least as rich as Iolis. However, as indicated above, *CALI Author* does not support the development of webpages directly. It is first necessary to build pages in a traditional, structured format. Those pages can then be exported to a web format. Although this provides some of the benefits of the web such as accessibility via the Internet, the difficulty with this approach is that authors do not have the freedom of being able to design their materials as webpages from the outset.

Next, the developer looked at web-based educational environments such as *Blackboard*[13] and *Web CT*. [14] These packages provided the means to develop interactions. However, the features were clearly designed for use in connection with quizzes and tests and did not seem to lend themselves readily to the integration of educational text and interactions. Furthermore, the range of interactions available was very limited. The developer then looked at a number of other web-based packages such as Questionmark's *Perception*[15] and *Teaching and Coursework Online (TACO)*[16] which purported to have the capability to enable development of interactions. However, like *Web CT* and *Blackboard*, these packages also seemed to have been designed solely with quizzes and tests in mind. While some of these packages did offer a somewhat richer collection of interactions, the range of interactions was still very limited by *Iolis* standards.

Moving on from these packages the developer considered the potential of using a combination of the highly successful web-authoring package *Dreamweaver 4*[17] together with an add-on educational package - Macromedia's *CourseBuilder*. This combination had been suggested by the LCC albeit with the warning that *CourseBuilder* was rather a difficult program to use. Initial experience suggested that, while this combination of software tools was not perfect, it did provide a means of developing a website comprising pages of integrated text and interactions. Furthermore, at first sight,

it appeared that the *CourseBuilder* package might have the potential to create a range of interactions approaching that of *Iolis* itself.

3.3. Challenges

The first challenge for the developer was that there was no obvious model for a legal research skills course. There are several very good books that help students to learn how to use both physical and virtual law libraries.[18] Also, there are many books either of a general nature or covering non-law disciplines that deal with how to carry out student research projects.[19] However, as yet there appear to be no books that show students how to conduct legal research projects. This meant that the developer's first task was not so much reinventing the wheel as inventing it from scratch! By becoming familiar with both the literature on using law libraries and the works on doing student research projects, together with his own experience of supervising undergraduate and postgraduate students at Durham, the developer endeavoured to put together a research skills course tailored specifically for undergraduate and taught postgraduate law students.

Turning now to technology, the developer, who had previously developed web-based materials either directly in hypertext mark-up language (HTML) or by using Microsoft *FrontPage*, immediately took to *Dreamweaver 4*. Although there were times when an existing knowledge of HTML still proved invaluable, it was soon clear why *Dreamweaver 4* has become so popular among website developers. It is a powerful, well-designed package with a large number of useful features which, none-the-less, is surprisingly easy to learn and to use. In addition, the success of *Dreamweaver 4* has resulted in a whole shelf-full of well-written reference manuals on its use[20].

CourseBuilder, by contrast, was not so intuitive. In fairness, part of the problem is that CourseBuilder is not well supported by reference manuals[21]. While many of the manuals that have been written for Dreamweaver 4 do contain brief descriptions of CourseBuilder features, these descriptions are so superficial that they are virtually useless to the would-be developer. Learning to use CourseBuilder's standard interactions proved to be less than straight-forward. Learning to develop completely new interactions to extend CourseBuilder's range and versatility so as to come reasonably close to Iolis proved to be hard. However, for all the technical difficulties that the developer experienced with CourseBuilder, he was eventually able to undertake the task of building webpages from scratch which integrated text and interactions reasonably successfully – a prototype exhibiting a high degree of fusion between Iolis and the web.

A workbook on legal research skills does not need anything like the degree of access to support materials that a workbook on a substantive law subject requires. If there had been a need for, say, a large collection of relevant cases, then the developer would have explored the question of whether direct access to individual full-text case reports held in a suitable web-based legal information system such as the *British and Irish Legal Information Institute (BAILII)*[22] would have provided a suitable substitute for the *Iolis* resource book. In fact, the only links that the developer thought were needed for the research skills prototype were either to a number of other research skills websites such as Pettit's *Internet for Lawyers* site,[23] or to web legal search tools e.g. Findlaw's *LawCrawler* [24] search engine and Carter's *Lawlinks*[25] web directory. Needless-to-say, in a web environment, creating links to these external websites was straightforward.

4. The Outcome

4.1. The Website

The main product of the project is a website containing self-paced learning materials on the topic of legal research skills. It is hoped that this prototype website will, in due course, prove useful to undergraduate and taught postgraduate law students doing dissertations. The website is designed to be used on its own or in conjunction with other materials on research skills situated either on other

campus websites or on the web at large. The website can also be operated in association with email or electronic conferencing technology. If need be, the website's own navigation system can be bypassed. Where this is done, the collection of individual webpages can be thought of as 'looseleaf' and, as such, can be freely sorted and selected. It is possible, for example, for a law school to develop a 'home-built' website with its own navigation system and incorporating some of the existing pages from the package together with web materials from elsewhere. For this reason, each individual page in the legal research skills website carries the developer's name and assertion of copyright!

The website, which is menu driven, consists of a collection of webpages many of which comprise text integrated with interactions. Apart from versions of the picture and sound and video page types which could have been implemented easily, but were not used in the prototype website, passable versions of the following *Iolis* page types were implemented in web format:

- Check box page
- Click on picture page
- Drag into category page
- Drag into order page
- Long answer page
- Matching pairs page
- Multiple choice page
- Popup page
- Scroll bars page
- Slideshow page
- Text selection page
- Text with diagram page.

It should be stressed that the legal research skills website is very much a one-off demonstration. Although its pages may be used as templates for pages on other websites, there are none of the function and facilities of an authoring tool. It is hoped, however, that the prototype may be of some use to those who, at a later stage, do develop an authoring tool of this type.

4.2. Evaluation

At the time of writing, the legal research skills website has not yet been subjected to evaluation. Even though the site is a prototype, evaluation of its content as well as its functionality should be a worthwhile activity as the subject matter of the site is intended to be directly useful to law students. How will the website be evaluated? It is anticipated that evaluation will be conducted in up to three stages. During the first stage, members of staff at Durham law school who are involved in teaching research skills and/or who have strong track records as legal researchers themselves will be invited to review and comment on both the contents and the functionality of the prototype website. It is anticipated that the site will then be altered and improved in the light of these comments.

The second stage of evaluation will involve Durham's own law students. This will take the form of inviting a small sample group who are in the process of doing dissertations to use the website and then express their views about the quality and usefulness of the materials by completing a paper or online questionnaire. Once this has been completed and any further alterations and improvements made to the website, a third stage of evaluation may be undertaken, if appropriate. This will involve making the website available to all Durham law students and inviting all users to express their views by filling in an online questionnaire.

4.3. Accessibility

If feedback indicates that the legal research skills website is a useful educational tool, it will be made available permanently on the campus intranet and integrated into the skills training and support that Durham

law students receive in connection with their dissertations. It is also possible that the prototype website will be made available to the whole community of law students via the Internet, if such a step is thought to be worthwhile. A decision will be made about wider accessibility once the project has been completed.

5. Conclusion

The developer concluded that, by applying the fusion model of convergence, it was possible to produce a prototype workbook that exhibited a number of advantages over *Iolis*. It is claimed that the prototype is:

- Accessible across the Internet or a campus intranet
- Customisable to the needs of individual law schools
- Flexible enough to reflect more of an author's own approach and style
- Interconnectable more readily with other campus websites and with the web at large.

The most significant weakness of the fusion-based model, however, is that converting the large number of existing workbooks in line with this approach is an awesome task. While it does not quite amount to rewriting the whole collection, it is not far short. Undoubtedly, for this pragmatic reason the conversion model of convergence will be a very attractive option to the LCC. A later version of *Iolis* in which the existing workbooks have already been converted into a web format will undoubtedly be seen as a practical way forward.

It would be a pity, though, to lose sight of the advantages of the fusion model. Perhaps a dual approach might be adopted. If a future *Iolis* comprises web versions of the existing workbooks, a future *Iolis Author* might, perhaps, be a more user-friendly version of *CourseBuilder*, with a richer collection of ready-to-use interactions. Authors could use existing or newly acquired skills to develop their own collections of webpages using a suitable general authoring package such as *Dreamweaver 4*. In the process of writing these pages, authors might then, where appropriate, insert interactions using this future version of *Iolis Author*. In conjunction with these tools and techniques, authors could use a set of existing 'best practice' templates provided e.g. by the LCC, or their own law school to build their workbooks. If they felt sufficiently confident, however, authors could forsake the templates and invent their own look, feel and functionality that matched their personal approach to the subject matter of their workbooks.

We know what *Iolis* looks like today, a decade after the inauguration of the Law Courseware Consortium. The purpose of this paper has been to stimulate discussion about what *Iolis* might look like in, say, another three to five years.

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[9] In Moodie, P. 'Law Courseware and Iolis' (1997) 1 *JLIT* at elj.warwick.ac.uk/jilt/cal/97_1mood/moodie.htm, Moodie asserts that *Iolis* must be protected from 'local adaptation' in order to protect the intellectual property rights of workbook authors. He does not, however, explain why he believes that authors' rights can only be protected by such functional rigidity nor why he thinks that the rights must inevitably outweigh pedagogical considerations.

[10] See the Netcraft Web Server Survey for January 2002 at www.netcraft.com/Survey/

[11] See Grantham, D. 'IOLISplus - Extending the electronic Learning Environment' (1999) 1 *JLIT* at elj.warwick.ac.uk/jilt/99-1/grantham.html and Grantham, D. 'IOLISplus - The Second Chapter' (2000) 1 *JLIT* at elj.warwick.ac.uk/jilt/00-1/grantham.html

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[13] www.blackboard.com/

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[18] See e.g. Clinch, P. (2001) *Using a Law Library* (London: Blackstone Press, 2nd edition); Holborn, G. (2001) *Butterworths Legal Research Guide* (London: Butterworths, 2nd edition); and Thomas, P. and Knowles, J. (2001) *Dane & Thomas: How to Use a Law Library* (London: Sweet & Maxwell, 4th edition).

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[24] lawcrawler.findlaw.com/

[25] library.ukc.ac.uk/library/lawlinks/default.htm