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Iolis Authoring in a Web Environment

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Abstract

Recently, there has been 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, 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 training at University level. In the light of these developments, Durham University's Centre for Law & Computing was asked to develop a self-paced learning package providing more advanced training on the skills necessary to do legal research projects.

It was envisaged that the learning package in question would take the form of an *Iolis* style workbook. Rather than use traditional law courseware authoring tools, however, the Centre chose to experiment by attempting from the outset to develop the workbook as a website comprising interlaced text and interactions. If successful, such an approach would have the benefits of producing a prototype that was: (i) readily accessible across the Internet, or a campus intranet; (ii) customisable to the needs of individual law schools; (iii) flexible enough to reflect more of an author's own person approach; and (iv) massively interconnectable with campus intranets and with the Internet at large.

> **Keywords**: *Iolis*, World Wide Web, convergence, models of convergence, legal research projects, dissertations, advanced legal research skills, prototype workbook.

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, electronic law tutorials and the futurology of legal education (Widdison et al., 1997; Widdison & Schulte, 1998; Widdison, 2000). The greatest focus however has been on the development and deployment of interactive learning packages such as *Iolis (*Scott & Widdison, 1994; Widdison, 1995). In relation to *Iolis*, the Centre was one of the original sponsors of the Law Courseware Consortium (LCC) <http://www.law.warwick.ac.uk/lcc/> which celebrates its tenth birthday this year. 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 writing half the total number of contract workbooks as well as a workbook on legal communication skills.

1.2. Legal Research Skills

Recently, there has been 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, the Law Society/Bar Council's *Joint Statement on Qualifying Law Degrees* <http://www.lawsoc.org.uk/dcs/fourth_tier.asp?section_id=3192#5585> and the Quality Assurance Agency's *Benchmark Standards for Law* <http://www.qaa.ac.uk/crntwork/benchmark/bencheval/law.htm> both place great emphasis on the need to improve research skills training at University level. Most if not all law schools already provide basic training in legal research skills. Such training takes the form of how to use physical and virtual law libraries and is typically made available to undergraduates in their first year. Subsequent training, though, is often rather sporadic and piecemeal.

Durham's response has been to move towards introducing a compulsory legal research project for final year undergraduates. This research project normally involves producing a 10,000 word dissertation. Such a project is seen as a key focus for providing more advanced training in legal research skills. Clearly, though, students need to be given adequate means to acquire the skills in question. The curriculum at Durham is already very full, however. In particular, there is little scope for extra contact time. With this dilemma in mind, Durham's Centre for Law & Computing was asked to develop a self-paced learning package designed to show undergraduates how to conduct sustained legal research projects. Our existing interest in - and extensive experience of - building *Iolis* style courseware led us to conclude that this type of approach might well prove suitable for such a package.

1.3. An Iolis/Web Prototype?

One obvious way of developing an *Iolis* style package on research projects would be to use *Iolis Author - Iolis's* dedicated authoring tool. However, there were a number of reasons why it was decided to take an alternative route on this occasion. Firstly, the power and the potential of the World Wide Web (the Web) inevitably demands constant rethinking about the way in which ICT is deployed in legal education (Geist, 1997). Nothing is sacred - not even a well-tried and successful system 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 electronic sources and search tools as with print sources and search tools, use of a Web based workbook by students would be a particularly relevant learning experience. Finally, *Iolis Author* has been out of action since Autumn 2001 (editor's note: a new edition of Iolis Author is available from September 2002). *Iolis* has been converted to a 32-bit format and the authoring tool has not yet been upgraded to work in conjunction with this new version (editor's note: the new authoring tool has now been upgraded to 32-bit format). For these reasons, the Centre concluded that it would be a useful and interesting educational experiment to build an *Iolis* style workbook in a Web environment.

2. The Issue

2.1. Iolis

The LCC developed, maintains and publishes *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 interlaced with interactions. These interactions are not just offered as detached revision tests and quizzes made available to students after they have completed the learning materials. The interactions can also be embedded at appropriate points within the learning materials themselves to encourage students to engage more deeply with those materials. In essence, interactions take the form not only of questions designed to test, but also of questions designed to teach (Mayer, 1997). The resource book component of *Iolis*, which is either directly accessible from the workbooks or can operate as a freestanding entity, contains a large collection of primary sources together with a smaller number of secondary sources.

What are the strengths of *Iolis*? The pedagogic approach of using self-paced learning materials comprising interlaced text and interactions - while admittedly less stimulating for the average student than human contact in e.g. tutorials - is widely thought to be more engaging and challenging than passive text alone (Jones & Scully, 1998; Paliwala, 2001). The underlying educational philosophy is succinctly expressed in the Chinese proverb: 'What I hear, I forget. What I see, I remember. What I do, I understand'. As for the workbooks themselves, there are now over one hundred of them covering fourteen mainstream legal subjects. These workbooks have all been written by authors who are academic specialists in their respective fields. The associated resource book has also grown until it now contains several thousand full text case reports, pieces of legislation and articles. This means that students have access to a powerful online library at the same time that they are using the *Iolis* workbooks. They can bring up on screen the majority of the sources cited and discussed in the workbooks by clicking on 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 reasonably well.

What then are the weaknesses of *Iolis*? Born into a pre-Web world, *Iolis* lacks many of the features that Web users now regard as standard. While it may be possible to launch *Iolis* from a Web browser, it cannot run across the Web. New and revised *Iolis* workbooks are sometimes delivered via the Web, but expansion and updating is not a constant process as it now is with many websites. For most users, upgrading takes place twice a year when a new CDROM arrives through the post and is duly installed. As originally envisaged, *Iolis* was planned to be customisable, allowing for a great deal of adaptation by law schools to fit in with their own educational philosophies. However, this feature was never implemented beyond the provision of a limited annotation facility (Moodie, 1997). Ten years ago, the level of authoring expertise was so low that a handholding, heavily standardised authoring tool was unquestionably the only way forward. Today, when it is common for academics to develop their own Web based materials, many would probably appreciate greater freedom to develop workbooks that reflected more of their own personal approach. *Iolis* does not exhibit the massive degree of interconnectivity that is a prime characteristic of a typical website. While clearly an important location in its own right, *Iolis* does not really function as a powerful gateway to

other campus intranets and to the Internet at large.

2.2. The Web

The Web is the principal publishing arm of the Internet. It is an access-orientated multimedia technology which unlocks the awesome power of hyperlinking. The Web is founded upon the notion of massive interconnectivity where every location - i.e. every webpage - is simultaneously capable of being a gateway to the rest of the Web. The importance of the Web is catching 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 is catching on at an enormously faster rate than any of these previous media.

One of the strengths of the Web is its huge popularity both as medium and as message. It is estimated that there are currently nearly 37 million servers connected to the Web (Netcraft, 2002). Usage of the Web is no longer measured in terms of thousands or millions of users, but in percentages of national and continental populations. As a result, the look, feel and functionality of webpages and the browsers that display them have become a dominant informational paradigm. Post-Web operating systems and applications - if they have not already migrated to the Web - frequently mimic some or all of the features of webpages and browsers. Another strength is that webpages and websites are often highly customisable by users. Not only can features such as backgrounds, fonts and colours be altered at will but, more importantly, users can select and sort individual pages from a variety of existing websites, and thereby create an entirely new website.

Let us now turn to the weaknesses of the Web. Its success has also to some extent given rise to its limitations. Being so huge, users can experience great difficulty finding useful materials. Much-vaunted search engines are now of declining value as they index ever smaller proportions of an ever-expanding Web (Lawrence & Giles, 1999). Furthermore, search engines lack the sophistication to cope with the poor signal to noise ratio that is often associated with the use of such engines. Human-made Web directories greatly improve the signal to noise ratio. However, they have struggled to keep up with the expansion of 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 is not always well adapted to specific uses. As we shall see, the development of the medium for self-paced, interactive learning purposes has been relatively unsophisticated, so far. Yet another problem is that, from an author's point of view, while there are only a few browsers in common use, many different versions of these browsers are being utilized. This, coupled with the ability that users have customise the display of each webpage, may contribute to a tendency to 'dumb down' Web materials in order to ensure maximum possible accessibility.

2.3. Models of Convergence

Given that both *Iolis* and the Web have strengths and weaknesses, is it possible to converge the two technologies so 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 are identified. They are as follows:

A. The Echo Model: This model involves gradually developing *Iolis's* interface to maintain a resemblance to the look, feel and functionality of Web browsers and webpages. The model is the easiest to achieve and, indeed, the LCC has been applying it for some years. As a result, the *Iolis* interface has some similarity to a Web browser. Recently, the directional arrows migrated from the right to the left of the *Iolis* toolbar to mimic the typical browser. Authors can now create hyperlinks 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 powerful gateway to other campus intranets and to the Internet at large. A particular problem with this echo model is that superficial resemblance masks the fact that, beneath the surface, *Iolis* technology is slipping ever further behind faster-moving Web technologies.

B. The Nesting Model: Such a model involves embedding *Iolis's* existing, non-Web workbooks and resource book within a website of other, related materials in order to create an enhanced and customised learning environment. Valuable work on this model has been done at Coventry University's School of International Studies and Law. This work has led to the development of a system called *IolisPlus*. The 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 (Grantham, 1999; Grantham, 2000). While this work is clearly both useful and important, perhaps its most significant message is to highlight the relatively unsatisfactory situation that we are currently in, and the pressing need for a fuller degree of convergence between *Iolis* and the Web.

C. The Conversion Model: This model involves enhancing *Iolis* by enabling it to export its existing non-Web pages as webpages. Interestingly, *CALI Author* - developed by the Center for Computer-Assisted Legal Instruction (US CALI) - already possesses such a facility. This came about as a result of merging an embryonic Web authoring tool called *Webolis* (Mayer, 1997) with an existing *Iolis* based authoring tool. Many of the workbooks created using *CALI Author* are now available both in traditional non-Web form and as websites. Adding a conversion facility would enable the LCC (or perhaps individual workbook authors) to export both existing and new *Iolis* workbooks to a Web format. Once converted, such workbooks would, of course, be 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. For example, authors do not have the degree of freedom that many have now experienced in the process of developing of their own Web based materials.

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 seeks to answer that question. It involves distilling authoring techniques from existing *Iolis* workbooks, 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 not just look like a website, or be embedded in a website, or be an exported Web version of *Iolis*. The two separate technologies would have been fully converged. The result of such a convergence might be workbooks with all the features that we associate with *Iolis* together with all the features that we associate with the Web. 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 might have to be virtually rewritten. This could be a huge undertaking consuming a great deal of time, effort and money. We will return to this difficulty in the conclusion.

3. The Project

3.1. Project Aims
The project undertaken by the Centre had the following aims:

- To develop a skills training package for undergraduates doing legal research projects;

- To build a Web based prototype workbook using *Iolis* authoring techniques;

- To explore the fusion model of convergence.

Achievement of these aims involved selecting a suitable Web development tool and using that tool to build the prototype workbook. The intention was then to evaluate the prototype in order to determine both its effectiveness as a research skills training package, and what it revealed about applying *Iolis* authoring techniques in a Web environment. The Centre obtained a grant from the City Solicitors' Educational Trust to fund the project. The grant was mostly used to cover replacement teaching costs so that an existing member of staff could undertake the development work. The remainder of the grant was used to buy appropriate Web development tools and relevant 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 in developing websites. It was decided that the duration of the project would be one year starting on 1 October 2001.

3.2. Choice of Development Tools
One the first tasks to be undertaken was the identification and acquisition of suitable Web

development tools. The developer began by looking at Web based educational environments such as *Blackboard* <http://www.blackboard.com/> and *Web CT* <http://www.webct.com/>. These packages provided the means to develop interactions. However, the features were clearly designed for use in connection with quizzes - questions asked to test - and did not seem to lend themselves readily to the integration of text and interactive teaching questions. Furthermore, the range of interactions available was very limited. The developer moved on to consider some other Web development tools. A number of such packages were examined including, for example, Questionmark's *Perception* <http://www.questionmark.com/uk/home.htm> and *Teaching and Coursework Online (TACO)* <http://taco.cs.ucl.ac.uk:8080/taco/www/>. However, like *Web CT* and *Blackboard*, these types of packages also seemed to have been designed to ask testing questions rather than teaching questions. Furthermore, while some of these packages did offer a reasonably rich array of interactions, the range of interactions was still very limited by *Iolis* standards.

Next, the developer considered the potential of US CALI's *CALI Author* package. *CALI Author* is derived from *Iolis Author* and is, therefore, very similar in many ways. It supports the development of pages of text interlaced with interactive teaching questions well. Furthermore, its range of interactions is at least as rich as *Iolis*. As indicated above, however, *CALI Author* does not support the development of webpages directly. It is first necessary to create pages in a traditional, structured format. These pages can then be converted - i.e. exported - to a Web format. Conversion does provide some of the benefits of the Web such as accessibility via the Internet. On the other hand, the learning materials seem to be no more customisable than the non-Web equivalent and that authors lack the freedom of being able to design their materials as webpages from the outset. The developer concluded that *CALI Author* was not a suitable tool to explore the fusion model of convergence.

Moving on from these packages, the developer considered using a combination of the highly successful Web development package *Dreamweaver 4* together with an add-on educational package - Macromedia's *CourseBuilder*. This combination had been suggested by the LCC albeit with the warning that, while *Dreamweaver 4* was easy and intuitive to learn and to use, *CourseBuilder* was, by contrast, much more difficult. Initial experience suggested that, while this combination of software tools was not perfect, it did provide a means to develop a Web based workbook comprising pages of text interlaced with interactive teaching questions. Furthermore, at first sight it appeared that the *CourseBuilder* package might have the potential to create as rich a range of interactions as *Iolis* itself. The developer concluded that the suggested combination appeared to provide the best affordable means of exploring the fusion model of convergence.

3.3. Challenges
The first challenge for the developer was that there was no obvious model for a course on legal research projects. There are several excellent books for students on basic legal research skills such as how to use both physical and virtual law libraries (Clinch, 2001; Holborn, 2001; Thomas & Knowles, 2001). 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 (e.g. Cryer, 2000; Luck, 1999; Sharp & Howard, 1996). However, there appear to be no books that show undergraduates how to conduct legal research projects. This meant that the developer's task was not so much reinventing the wheel as inventing it from scratch! To do this, he first became familiar with the existing literature on basic legal research skills, and the non-legal works on doing student research projects. Then, adding in his own experience of supervising undergraduate and postgraduate students at Durham University, the developer endeavoured to put together a course on legal research projects tailored specifically to the needs of undergraduates.

Turning now to the technology, the developer who had previously created 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 many useful features which is, none-the-less, surprisingly easy to learn and to use. In addition, the success of *Dreamweaver 4* has resulted in shelves full of well-written reference manuals on its use.

CourseBuilder, by contrast, was nothing like so intuitive. In fairness, part of the problem is that *CourseBuilder* is not well supported by reference manuals. While many of the manuals that have been written for *Dreamweaver 4* do contain brief descriptions of *CourseBuilder* in the appendices, 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 straightforward. Learning to develop completely new interactions in order to extend *CourseBuilder's* range of interactions proved to be very hard for someone without a computer programming background. However, despite all the technical difficulties that the developer experienced with *CourseBuilder*, he was eventually able to make progress creating webpages that interlaced text and interactive teaching questions reasonably successfully - a prototype workbook exhibiting quite a high degree of fusion between *Iolis* and the Web.

A workbook on legal research projects does not need anything like the degree of access to additional support materials that a workbook on a substantive law subject requires. If there had been a need for access to a large collection of e.g. full text primary sources, the developer would have examined whether direct access to legislation and case reports held in a Web based legal information system such as the *British and Irish Legal Information Institute (BAILII)* <http://www.bailii.org/> might have provided a suitable alternative to the *Iolis* resource book. In fact, the only links that the developer decided were needed for the prototype workbook were either those to other research skills websites such as Pettit's *Internet for Lawyers* site <http://www.sosig.ac.uk/vts/lawyers/start.htm> or those to Web legal search tools such as Findlaw's *LawCrawler* <http://lawcrawler.findlaw.com/>.search engine and Carter's *Lawlinks* <http://library.ukc.ac.uk/library/lawlinks/default.htm>. Web directory. Needless-to-say, in a Web environment creating links to these external websites was straightforward.

4. The Outcome

4.1. The Workbook

The main product of the project is a workbook in the form of a website containing self-paced learning materials on legal research projects. It is hoped that this prototype workbook will, in due course, prove useful to undergraduates doing legal research projects. The workbook itself is designed to be used either on its own, or in conjunction with other research skills materials whether situated on other campus intranets, or on the Internet at large. The workbook can be operated in association with synchronous and asynchronous computer communications technologies (Woods, 2001). If need be, the workbook's own navigation system can be bypassed completely. Where this is done, the individual webpages can be thought of as 'looseleaf' in the sense that they can be freely sorted and selected. It is possible, for example, for a law school to assemble a 'home-built' website with its own navigation system incorporating some of the existing pages from the workbook together with Web materials from elsewhere. For this reason, each individual page in the workbook carries the developer's name and an assertion of copyright!

The prototype workbook, which is menu driven, consists of a collection of webpages a high proportion of which comprise text interlaced with interactive teaching questions. Versions of the picture & sound and video page types were not used in the workbook although they could have been implemented easily. Acceptable versions of the following *Iolis* page types were implemented in Web format and can be seen in the workbook:

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

It should be stressed that the prototype workbook is very much a one-off demonstration of what is possible. Although its pages and interactions can be used as a source of ideas, or even as a set of templates for other websites, it has none of the functions and facilities of an authoring tool. It is hoped, however, that the workbook may be of some value to those who develop an *Iolis*/Web authoring tool at a later stage.

4.2. Evaluation

The evaluation of the website is being conducted in four stages. A prototype version of the website was presented at the seventeenth BILETA Conference at the Free University of Amsterdam at Easter 2002 (Widdison, 2002). During the second stage, those members of staff at Durham's law department who themselves have strong track records as legal researchers were invited to review and comment on the form and content of the website. The third stage of evaluation involved a small group of Durham's law undergraduates who had recently completed legal research projects. These students were invited to examine the website and to express their views about the quality and usefulness of the materials by filling in and returning an electronic questionnaire. Feedback from each stage of evaluation so far has been used to revise and improve the website. It is anticipated that a fourth stage of evaluation will be undertaken next year. This will involve making the website available to all final-year Durham law undergraduates and inviting them to express their views on it by filling in and returning a questionnaire.

4.3. Deployment

As feedback from the three stages of evaluation conducted so far indicates that the research skills website is likely to prove a valuable educational tool, steps are now being taken to make the site available permanently on the campus intranet and to integrate the site as a major component of the training and support that Durham law undergraduates receive in connection with their legal research projects. It is possible that the website will also be made available to the wider community of law students via the Internet, if such a step is thought to be appropriate. A decision will be made about wider accessibility in due course.

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:

- Readily 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 personal approach;

- Massively interconnectable with campus intranets and with the Internet at large.

However, the most significant weakness of a fusion based approach, as we have seen, is that converting the large number of existing *Iolis* workbooks is an awesome task. While it does not necessarily amount to rewriting the whole collection, it may not fall far short. Undoubtedly, for this pragmatic reason the conversion model of convergence will be a compelling preferred option for the LCC. A later version of *Iolis* in which the existing workbooks are available either in traditional or converted Web format will undoubtedly

be seen as a practical way forward.

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

A decade on from the inauguration of the Law Courseware Consortium, we are familiar with the contemporary version of *Iolis* - how it looks, how it works, and how it is deployed and used. However, what will *Iolis* be like five years from now?

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