

Law, Information and Technology -

“Why the Contents of Portia’s Caskets Matter More than the Caskets themselves”

Outline of presentation by Craig Duncan

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Introduction

This paper is intended to generate greater interest in, and awareness about, the distinction between ‘information’ technology, and ‘electronic’ technology. A significant contribution of ‘electronic’ technology at the present time is related to overcoming remoteness in access to judicial processes, and overcoming the difficulty and expense of physically transporting documentary evidence to a Courtroom. The latter is still largely associated with the topic of ‘access to justice’ and is the focal point of topics like ‘e-trials’ and ‘e-discovery’. The ‘e’ in both cases refers to the electronic aspect of the exercise, rather than the informational content.

In the Merchant of Venice, Portia’s use of caskets is an information puzzle. It relies on an attempt to discern meaning from the superficial appearance of the containers, and to what they symbolise in relation to their contents. I am using this physical plot device as a metaphor, the distinction between the symbolic ‘medium as the message’ of the container, and the information within it. In my view, this illustrates neatly the distinction between electronic and information technology.

Electronic technologies, such as document images, or video conferencing, are valuable because of the medium itself: their electronic nature. In this way, they function as an extension and enhancement of an existing process, and aim to recreate the same experience in a slightly different

way. Indeed, some of the criticisms of remote videoconferencing so far have been that they do not recreate the Court experience sufficiently well.¹

In contrast, information technology should allow far greater opportunities to alter the way in which we experience and interact with information. Information technology can encapsulate information, but it is not limited in the way it does so. Its potential is to go beyond merely encapsulating information electronically, and explores ways of doing so that provide new opportunities for interaction, use and learning.

In this paper, I discuss some of the technology available in the legal system and to Courts, but my focus is on legal documentation as an information record.

There are two contexts in which electronic technology can be discussed in relation to the documents that concern litigation and legal work:

- (a) the contexts in which generic software has replaced traditional paper media, such as the sophisticated word processors, spreadsheets and power point presentation software (for pre-trial documentation and for the judgment produced by the Court); and
- (b) the way in which Courts construct a database of information for use in trials, including the receipt of routine documents like witness statements, statements of facts, submissions, pleadings, transcript, lists of authorities, trial bundles, and scanned client documents.

I present some existing models from other disciplines that focus attention on the evolution in the role of information technology in the legal system.

¹ Rowden, E., Wallace, A., Tait, D., Hanson, M., & Jones, D. (2013). Gateways to Justice: Design and Operational Guidelines for Remote Participation in Court Proceedings. University of Western Sydney. URL: <http://www.uws.edu.au/justice/justice/publications> (Last accessed 18 June 2018). Also: https://www.westernsydney.edu.au/_data/assets/pdf_file/0019/471223/Gateways_to_Justice_Guidelines.pdf

Videoconferencing facilities in use in courts

Some types of electronic technology are closer to pure communication systems than they are to symbolic representation systems, such as language and graphics. Due to the size of the territory in Australia, the adoption of communication technologies to permit the giving of evidence or conduct of Court proceedings by people who are in remote locations has been actively developed. In relation to these 'judicial communication systems', however, an Australian study found there had been a lack of consistency and design input into many video conferencing facilities, particularly those in remote locations. In this regard, Maharg referred to the extensive Courtroom videoconferencing study authored by Rowden et al.² The forward to that report stated:

“While courts are conservative institutions, and that is often justified, they are not immune to changes in society, nor should they be. In particular, we have seen in recent times the significant developments of technology used to enhance the delivery of justice by courts in many ways. Indeed, the introduction of modern forms of technology into courtrooms has been one of the most significant changes in courts in recent decades. None of these technologies has had a greater impact than videoconferencing and CCTV, which, as this report notes, is now widely used in courts for a variety of purposes.”

The observations in that report, after literature reviews, interviews and site visits,³ included numerous references to the lack of ability of the facilities in many remote locations to recreate closely the normal courtroom environment and experience, with naturalness and authenticity. This included not only the lighting, camera position and comfort level of participants⁴, but the sense that they were in a formal environment, where the Court was to be seen as an

2 Rowden, E., Wallace, A., Tait, D., Hanson, M., & Jones, D. (2013). Gateways to Justice: Design and Operational Guidelines for Remote Participation in Court Proceedings. University of Western Sydney. URL:

<http://www.uws.edu.au/justice/justice/publications> (Last accessed 18 June 2018). Also: https://www.westernsydney.edu.au/_data/assets/pdf_file/0019/471223/Gateways_to_Justice_Guidelines.pdf

3 Rowden, E., Wallace, A., Tait, D., Hanson, M., & Jones, D. (2013). Gateways to Justice: Design and Operational Guidelines for Remote Participation in Court Proceedings. University of Western Sydney. pp29-32. URL:

<http://www.uws.edu.au/justice/justice/publications> (Last accessed 18 June 2018). Also: https://www.westernsydney.edu.au/_data/assets/pdf_file/0019/471223/Gateways_to_Justice_Guidelines.pdf

4 Rowden, E., Wallace, A., Tait, D., Hanson, M., & Jones, D. (2013). Gateways to Justice: Design and Operational Guidelines for Remote Participation in Court Proceedings. University of Western Sydney. p32. URL:

<http://www.uws.edu.au/justice/justice/publications> (Last accessed 18 June 2018). Also: https://www.westernsydney.edu.au/_data/assets/pdf_file/0019/471223/Gateways_to_Justice_Guidelines.pdf

authority and there were expectations regarding demeanour.⁵ The report recommended improvement in the use of cameras, facilities and video equipment for video conferencing in Courts.⁶ One of the lessons of this study, co-authored by an architect, was that the desire to create a particular experience would need to be considered at the stage of design of the facility.

Electronic trials and the use of technology in litigation

Twenty five years ago, when the internet was first becoming accessible to the non-academic public, Courts in Australia began to introduce 'electronic trials'. In doing this, judges took up the new communications technology, to facilitate the creation of databases of documents and the possibility of viewing them on television screens or computer monitors. Video evidence and other communication devices became part of the Court's standard service offerings. Objects that were text on paper were transferred to the Court for viewing in the same form, but within an electronic device. Documents had the same structure and encapsulation of information that had always existed. As one Queensland judge, Richard Chesterman, explained at a conference in 2003: "The advantages of an electronic format are, no doubt, compactness, that is economy of space, ease of communication and so on, and the quick retrieval of documents and their display on a monitor. Of course this last feature depends on the quick identification of the document so it can be retrieved. The disadvantage of documents in electronic form is that they are harder to read in print and harder to compare with other documents when a contemporaneous comparison is called for."⁷

The procedures now common in the Courts reflect what occurred in that early transition to 'electronic technology' 10 to 20 years ago. This facilitated the Courts gaining access to documents produced within firms using generic office software. What had been lists on paper became lists in Excel. What had

5 See [Rowden, E.](#) 2017, 'Distributed Courts and Legitimacy: What do we lose when we lose the courthouse?', *Law, Culture and the Humanities*.

6 Atwood, A Higher quality court videolinks will improve justice outcomes: study. *The Conversation*. URL: <https://theconversation.com/higher-quality-court-videolinks-will-improve-justice-outcomes-study-15453> (Last accessed 19 June 2018).

7 Justice R N Chesterman, '[Managing Complex Litigation](#)' (Speech delivered at the Queensland Law Society's Continuing Legal Education Program, Brisbane, 22 October 2003) ; Available from URL: <https://www.sclqld.org.au/judicial-papers/judicial-profiles/profiles/rnchesterman/papers/1>

been a typewritten document became a document in Word. Transcripts became searchable text, but were still sequential narratives of the evidence, from start to finish. Documents created in a specific form needed to be scanned, and then additional information (meta-data) added to them.

Some judges claim that there is a restricted range of appropriate cases for the use of electronic documents, when they comprise an 'electronic data base'.⁸ Richard Chesterman (speaking after 5 years experience as a Supreme Court judge) said, in 2003: "The recent experience which I mentioned earlier makes me suspect that the use of documents in electronic form **to replace paper copies** is not likely to be successful"⁹ (my emphasis). Chesterman referred to the more successful context in which Royal Commissions (including the one conducted by Justice Wood in the 1990's) have used scanned documents, particularly where each document was short, in the nature of "minutes or emails or inter-office memoranda". Chesterman was an advocate of agreed bundles, containing "the important documents" for 'ease of reference and convenience' and it should not be too large. He was in favour of bundles of documents for use in the examination of each witness, even if there was a small amount of duplication in doing so.

In relation to transcripts, Chesterman said that 'real time transcript' had been useful for preparing addresses and judgments, but did not do much to assist the trial process itself.¹⁰ He suggested that it was a bit distracting, but the main reason it was not as effective was that the trial itself was concerned with watching witnesses give evidence, not the screen.

Chersterman also referred to the receipt of testimony by telephone and video conferencing, frequently for medical cases and sometimes criminal trials.

8 Justice R N Chesterman, '[Managing Complex Litigation](https://www.sclqld.org.au/judicial-papers/judicial-profiles/profiles/rnchesterman/papers/1)' (Speech delivered at the Queensland Law Society's Continuing Legal Education Program, Brisbane, 22 October 2003) ; Available from URL: <https://www.sclqld.org.au/judicial-papers/judicial-profiles/profiles/rnchesterman/papers/1>

9 Justice R N Chesterman, '[Managing Complex Litigation](https://www.sclqld.org.au/judicial-papers/judicial-profiles/profiles/rnchesterman/papers/1)' (Speech delivered at the Queensland Law Society's Continuing Legal Education Program, Brisbane, 22 October 2003) ; Available from URL: <https://www.sclqld.org.au/judicial-papers/judicial-profiles/profiles/rnchesterman/papers/1>

10 Justice R N Chesterman, '[Managing Complex Litigation](https://www.sclqld.org.au/judicial-papers/judicial-profiles/profiles/rnchesterman/papers/1)' (Speech delivered at the Queensland Law Society's Continuing Legal Education Program, Brisbane, 22 October 2003) ; Available from URL: <https://www.sclqld.org.au/judicial-papers/judicial-profiles/profiles/rnchesterman/papers/1>

He doubted it worked well when witnesses had to identify documents in the courtroom, but if there was a video link to the evidence it was achievable.

Finally, Chesterman mentioned the use of ‘electronic technology for the delivery of judgments’, and referred to the fact he delivered reasons for judgment by CD-ROM. It saved on photocopying, and in large documents also enabled ease of navigation. In smaller judgments, judgment could be delivered by email.

I refer to this because it illustrates that the use of electronic technology by the Courts was originally justified on the basis that it provided advantages in the medium for communication, but did not change the original form of encoding the information itself. In many respects, this was concerned with the physics of communication. As Chesterman’s paper illustrates, the concern was with ‘electronic’ technology even more so than ‘information’ technology.

That was the position in 2003 and it still is. The Supreme Court of Western Australia’s reference to electronic trials still places the emphasis on electronic technology, rather than information technology. The current Tender List Protocols for E-Books are those published in 2007.¹¹ The conception of an electronic trial in the Supreme Court¹² is one in which a database of relevant documents is to be prepared. The Supreme Court’s website summarises the practice this way:

“A database is available for use in matters heard in the electronic courtrooms of the Supreme Court in Perth. The Court’s capability and practices for e-Trials and e-Appeals are set out in the Consolidated Practice Directions (see 1.2.5 – The Use of Electronic Material in Trials and Appeals).

Before a matter receives a hearing date, the court and relevant parties must decide if the hearing is to be conducted using electronic technology. If so, documents relevant to the matter must be submitted electronically for compiling on the database.”¹³

11 The Tender Protocol can be downloaded from http://www.supremecourt.wa.gov.au/E/e_trials.aspx?uid=2816-2885-5726-6430 (Last accessed 13 June 2018).

12 Supreme Court of Western Australia. *Consolidated Practice Directions (2009)*, PD 1.2.5 “*The Use of Electronic Material in Trials and Appeals*”. Available from URL: http://www.supremecourt.wa.gov.au/files/Consolidated_Practice_Directions.pdf (as at 7 May 2018). Last accessed 13 June 2018.

13 http://www.supremecourt.wa.gov.au/E/e_trials.aspx?uid=2816-2885-5726-6430 (Last accessed 13 June 2018).

Further, in the Supreme Court's own words¹⁴:

"1. At a technical level the Supreme Court of Western Australia is well advanced in the provision of electronic litigation support services.

2. The Court has the capacity to take electronic material from the parties, format it into its own trial/appeal/case book and then return copies of this book to the parties electronically.

3. In this way the Court and the parties then use the same material, formatted the same way, with the same identification of documents. By dealing with electronic material in this way, the Court is able to accommodate differences in the systems used by litigants and no particular proprietary system has to be acquired either by the litigants or the Court."

The Supreme Court has published a technical guide to this process (latest version 2014¹⁵). In general, the Supreme Court accepts documents in PDF format, but will accept Court documents in Word document format.¹⁶ These are the main forms in which information is stored: they represent the choices for the 'container' within an electronic library of information. At this general level, the Court recognises electronic document storage and referencing systems are varied and some are based on proprietary systems. It has adopted the pragmatic solution that it will take responsibility for the final presentation of the electronic trial book.

Software and data structures can use information that is represented and stored in a form other than a scanned image, a PDF or as a Word or Excel document. The lack of interest in exploring this potential is likely to remain until there is a sufficient understanding of how software and data structures can use information that is represented and stored in a form other than a scanned image, a PDF or as a Word or Excel document.

14 Supreme Court of Western Australia. *Consolidated Practice Directions (2009)*, PD1.2.5, paragraphs 1 to 3. Available from URL: http://www.supremecourt.wa.gov.au/_files/Consolidated_Practice_Directions.pdf (as at 7 May 2018). Last accessed 13 June 2018.

15 Supreme and District Courts of Western Australia. *TECHNICAL GUIDE FOR PREPARING & SUBMITTING DOCUMENTS FOR e-TRIALS*. 30 July 2014 (Version 4). Available at URL: http://www.courts.dotag.wa.gov.au/_files/e_trialssubs.pdf (Last accessed 13 June 2018).

16 Supreme and District Courts of Western Australia. *TECHNICAL GUIDE FOR PREPARING & SUBMITTING DOCUMENTS FOR e-TRIALS*. 30 July 2014 (Version 4), paragraphs 3.1.1 and 6.1.1. Available at URL: http://www.courts.dotag.wa.gov.au/_files/e_trialssubs.pdf (Last accessed 13 June 2018).

The discipline of how legal concepts and related information can be stored as data structures, regardless of the technology, is still in its infancy. It is likely that it will take some time and education before this becomes widely acknowledged, and probably further time until some systems are developed that are satisfactory to the Court and the profession for capturing information in other ways. This may not be in the commonly assumed methods of create a knowledge base by using relational databases.

The required knowledge does not mean being able to 'code' or participate in a 'hackathon'. Rather, it means understanding how document management systems differ from information management systems, and how such information management systems are designed, and how they are populated with data. The input of legal professionals into such a process will be facilitated by some instruction and examples in how existing legal information (such as substantive law, legal tutorials, legal judgments and whiteboard presentations) might be conceived as structured information.

To the extent that Courts still refer to electronic trials and to electronic technology, rather than information technology, they are not yet ready to embrace the use of technology as a way of capturing and manipulating legally-relevant information held within data structures.

Even at the point where legal information literacy has improved, it will be necessary for the Courts to decide how to provide shared data structures for the legal information, and not merely traditional PDF or Word documents as the electronic containers for legal information.

Evolution of the role of Computers/Information Technology in Law

A useful survey of schools of legal philosophy that impacted on education, and the use of computers in learning was prepared in 1992 by Abdul Paliwala, who stated, inter alia:

“There have been new influences in legal education in this century. These have included the notion of law as a science, as well as insights

derived from sociology, anthropology, economics, psychology and more recently linguistics".¹⁷

It is useful to have regard to models for the evolution of information technology that have been used in other contexts, such as in general education. For example, as long ago as 1993, educator Stephen Heppell¹⁸ described four stages of evolution in the role of information technology in education, namely:

- (a) Topicality (the computer itself as a topic, or focus of attention);
- (b) Surrogacy (the computer being used to deliver enhanced versions of existing activities);
- (c) Progression (from useful little programs to generic software tools made by teams of programmers); and
- (d) Pedagogic evolution (awareness that computers change the learning environment and learners too¹⁹). One definition of pedagogy is 'any conscious activity by one person designed to enhance learning in another'.²⁰

By way of comparison, Martin and Grudziecki (2006) later identified three levels or stages for digital literacy development:

- (a) digital competence (skills, concepts, approaches, attitudes, etc.);
- (b) digital usage (application of digital competence within specific professional or domain contexts); and
- (c) digital transformation. Where digital usages are developed to "enable innovation and creativity, and stimulate significant change within the professional or knowledge domain" (p.259).

17 Paliwala, A (1992) Transforming Legal Learning. *Computers Educ.* 19(1/2) pp113-124.

18 Heppell, S. (1993) Teacher Education, Learning and the Information Generation: the progression and evolution of educational computing against a background of change, *Journal of Information Technology for Teacher Education*, 2:2, 229-237

19 Heppell, S. (1993) Teacher Education, Learning and the Information Generation: the progression and evolution of educational computing against a background of change, *Journal of Information Technology for Teacher Education*, 2:2, 229 at 233.

20 Mortimore, P. (Ed.) (1999) *Understanding Pedagogy and its Impact on Learning*. London: Paul Chapman, p. 17

It is useful to examine how the use of technology in relation to e-trials fits within Heppell's educational model. First, even though sophisticated generic software tools are used by law firms to prepare Court documents like witness statements and pleadings, this may not reflect the same stage of evolution in law as in an educational setting. That is, rather than opening up possibilities for new ways to learn or practice law, this software permitted lawyers to prepare enhanced versions of previously typewritten paper documents: in effect, a Surrogacy role. Secondly, when these documents are transferred to the Court in an electronic form, it is simply an enhanced way of providing the documents to the Court, yet another Surrogacy role.

The ability to provide electronic access to legal cases changed the way that lawyers carried out research and interacted with information structures. In that respect, that represents an evolution that is closer to the 'Progression' and 'Pedagogic' stages, at least in respect to that activity.

Some of the recent tools, such as the ability to search documents and train applications to predict the relevance of documents appear to change the interaction of lawyers with information, but on closer inspection, they are offering an enhanced ability to locate relevant material, but not changing the nature of the way in which the information is used in the process. Again, this is arguably still a Surrogacy application: it enhances an existing activity.

In 1993, Heppell suggested that in an educational context, the requirements to achieve the Pedagogic Evolutionary stage would be recognising the new ways in which the 'information generation' of learners and when the pedagogy reflected the changes in traditional methods and assumptions "on offer from "rapid hardware and software evolution." This would also require more research into teacher cognition and ways in which teachers could understand the new information generation and also appreciate the potential for change in the learning environment.²¹

21 Heppell, S. (1993) Teacher Education, Learning and the Information Generation: the progression and evolution of educational computing against a background of change, *Journal of Information Technology for Teacher Education*, 2:2, 229 at 235. (Published online in 2006: <https://www.tandfonline.com/doi/pdf/10.1080/0962029930020210?needAccess=true> Last accessed 18 June 2018).

In my view, many of these observations would apply to the legal profession, in particular judges, and many lawyers in law firms today, primarily because information (as distinct from electronic technology) has not received the same attention in law as it has had in education. To build better information tools for the Courts, it has to be built with them, but by leading them toward an appreciation of what they are missing.

So what has happened in the last twenty years in education? Heppell still works in learning design, but he speaks about designing physical learning spaces as well as online ones, and predicts the future will involve global not local learning. He suggests that online environments will involve surprises and changes in technology, which students will need to be prepared for.²² A later review²³ concluded that the main interlocking factors affecting the successful takeup of ICT by teachers in classrooms were the institution, resources and the teacher. In the field of education, attention in Australia is now focussed on providing teachers with professional development in the area of ICT education.²⁴

In the context of law, there is some evidence of similar developments. In 2005, Bloxham referred to the increasing use of email and word processing software within legal education, as well as internet-based research.²⁵ One matter addressed by Bloxham was the potential range of 'e-learning' tools. The potential roles for information technology in law outlined by Bloxham included 'different types of learning environments or teaching pedagogies, 'distance learning' and 'distributed learning'.²⁶ He also described virtual learning environments (VLE) and access to course materials electronically.²⁷ An example given was the use of the IOLIS (tutorial) learning system.²⁸ In my view, the list included many technologies where the role would be classified as

22 See <https://edtalks.org/#/video/stephen-heppell> (Last accessed 18 June 2018).

23 Mumtaz, S. (2000) Factors affecting teachers' use of information and communications technology: a review of the literature, *Journal of Information Technology for Teacher Education*, 9:3, 319-342 at 335. (Available at <https://www.tandfonline.com/doi/pdf/10.1080/1475939000200096?needAccess=true>. Last accessed 18 June 2018).

24 Pearson, J. (2003) Information and Communications Technologies and Teacher Education in Australia, *Technology, Pedagogy and Education*, 12:1, 39-58 at p40.

25 Bloxham, S. (2005) Widening access and the use of ICT in legal education, *The Law Teacher*, 39:1, 93-105, at p95.

26 Bloxham, S. (2005) Widening access and the use of ICT in legal education, *The Law Teacher*, 39:1, 93-105, at p99.

27 Bloxham, S. (2005) Widening access and the use of ICT in legal education, *The Law Teacher*, 39:1, 93-105, at p101.

28 D. Grantham (2000), "IOLISplus—The Second Chapter", *Journal of Information, Law and Technology*, at https://warwick.ac.uk/fac/soc/law/elj/jilt/2000_1/grantham/ (last visited 18 June 2018).

one of 'Surrogacy' in Heppell's model (or possibly Progressive, to the extent that the use of wordprocessors and databases was involved). The IOLIS system was an example of something that would have been described within Pedagogy Evolution, but it appears that this did not become a mainstream educational tool.

At about the same time, Hummel, Paas and Koper outlined a study undertaken to determine if explicit technology-led cues to students assisted in their preparation of a pleading.²⁹

In law teaching, the casebook method (of discussing specific cases) has led to the migration of casebooks for these methods into e-casebooks (a process that mirrors the way in which the Courts have approached e-trial technology). A 2010 literature review stated "However, the typical e-Casebook does not go beyond being an e-version of the paper casebook, and it is clear that the pressure from publishers will be strong to use the new technology to do little more than to put text on screen with the advantages of hypertext, searchability and note-taking facilities; pressure which will grow with the limitations of e-readers such as Kindle and Sony."³⁰

Recently, in 2012, Carruthers, Galloway and Skead observed that in a survey of property law teachers:

"Of further interest is the absence of online teaching in the majority of property law units. The survey responses reveal that a basic website typically exists for online access of recorded classes. Eighty seven per cent of respondents report recording classes, with 86 percent of those respondents indicating that there is no time limit placed on the accessibility of recorded classes. The availability of recordings with associated power-point slides and a basic discussion forum is relatively common practice. However, there is an absence of more innovative online teaching methods in this subject area."³¹

The conclusion of that study was that on-line resources was being under-utilised in property law, but there were still further questions to be

29 Hummel, H. Paas, F. Koper, E (2004) Cueing for transfer in multimedia programmes: process worksheets vs. worked-out examples. *Journal of Computer Assisted Learning*, Oct 2004, Vol.20(5), pp.387-397

30 Paliwala A.(2010), "Socrates and confucius: a long history of information technology in legal education", in *European Journal of Law and Technology*, Vol. 1, Issue 1, 2010. (Available at ejlt.org as at 18 June 2018).

31 Carruthers, P. Skead, N, Galloway, K. (2012) Teaching, Skills and Outcomes in Australian Property Law Units: A Survey of Current Approaches, 12 *Queensland U. Tech. L. & Just. J.* 66

answered about what kinds of access, or legal skills (including collaboration and communication skills), could be derived or enabled by on-line resources.³²

The increasing use of computers has meant that barriers to entry like minimum digital literacy are becoming less of an issue, but there is still a need to question what kind of digital engagement is being pursued and why; to distinguish between basic skills in using ICT and the skilled use of information technology for a particular educational goal.³³ In addition, the use of 'online' teaching methods must be distinguished from novel and improved forms of teaching, with better learning, that could only be achieved with the use of current technology. The availability of lectures online, for example, increased the accessibility of lecture material, but it does not necessarily reflect a change in the nature of the lectures or the material referred to, and the benefits for learning are not always measured.

Technology in litigation in the 21st century

There is significant scope for improving the attention given to information technology in the context of dispute resolution, including litigation.

In the last few years, litigation support departments in firms have grown, and lawyers often leave the detailed working with e-discovery technology to a team of experts. The electronic discovery market has grown, with large software houses producing several competing e-discovery tools³⁴, and selling the virtues of 'technology assisted review' (TAR), and 'predictive coding'. Other acronyms have arisen to capture the workflow involved in such a process, including the Duke Law scheme.

These are terms used to describe the computer-assisted search for relevant documents in Court proceedings. The assistance able to be provided is straight from computer science – ways of enabling statistical correlations between features of documents or electronic files and some human

32 Carruthers, P. Skead, N, Galloway, K. (2012) Teaching, Skills and Outcomes in Australian Property Law Units: A Survey of Current Approaches, 12 *Queensland U. Tech. L. & Just. J.* 66 at p84.

33 In a general context, with an east-coast USA situation, see Nelson, K. Courier, M. Joseph, G. (2011). Teaching Tip: An Investigation of Digital Literacy Needs of Students, *Journal of Information Systems Education*, Vol. 22(2) 95

34 NUIX, etc

categorisation scheme. They usually involve the need for ‘training’, to make these correlations explicit and captured by the statistical weightings stored in the computer. The end result is that what was often an incredible large amount of potential information is reduced to only a very large amount of information: sometimes hundreds of thousands instead of millions.

The outcome of the use of these technologies is to use, in the background, ways of examining the structure of information. It is possible to identify those documents, or people, who are centrally located in a network of events, or transactions, or textual references. This way of mapping information, and visualising it, is quite different from the historical concern of lawyers for events and the legal conception of social reality. At this stage, however, the technology in use for electronic discovery does not show any signs of influencing the way that lawyers bring a conception of information into their own work or legal education. It seems the gulf may be too wide to be bridged in the short term, and will require incremental understanding of the nature of the task yet to be undertaken.

A recent case in the United Kingdom, namely *Triumph Group v Primus*³⁵, is an example of a failure in the process of technology assisted review (described there as “Computer Assisted Review, or CAR). There the CAR was not only unilaterally undertaken and undisclosed, but poorly carried out and unreliable in any case. The case is also noteworthy for the lack of precision in both the procedure for the supervised learning algorithm, and the lack of clarity in the judgment. The Court referred to the evidence that there was only a 38% ‘accuracy’ in the prediction (of the 1% of documents sampled). However, there was no indication that the supervised learning algorithm had been trained to higher accuracy, and then the discovery list produced. The prediction there seems to be the only assessment of whether the computer-based process was useful at all, and should not have been used for the final selection of documents.

35 *Triumph Group Acquisitions Corp v Primus International Holding Co.* [2018] EWHC 176. Available at <http://www.bailii.org/ew/cases/EWHC/TCC/2018/176.html> (last accessed 13 June 2018).

Alternatives to market provision of ICT software and educational tools

Maharg³⁶ has recently reviewed the trends towards convergence of ICT in a number of respects, and concluded that there are alternatives to going to the market in relation to legal products, and also empirical analysis of a legal nature. He gives as an example where crowd-funded campaigns have been organised. He also referred to 'hackathons' and then concluded that legal education too often occurred in organisations that acted as knowledge silos instead of collaborative environments:

“Forms of convergence such as this, I would argue, are what are needed in legal education. Their qualities are those of the New Media communities identified by Benkler (2007). In the domain of education there are four areas in which such convergence could take place: in organizations, resources, design and assessment. Most formal legal education takes place in organizations that act as silos for knowledge, isolated, often in competition with each other, rarely acting in concert with other organizations in education or in society generally. The organization's educational resources often consist of handbooks, lectures, course outlines - closely-guarded downloads, which are seldom freely available, unless (rarely) part of an OER programme or a MOOC. The design of programmes is often on a hierarchical block model: modules or subjects, with lock-step advance, where subjects within a module must be passed in series, and where modules must be passed in series too. Assessment of substantive content often takes the form of snapshot assessment, in essays or in examinations. And too often there is little rigorous, systematic educational research on the forms of legal education that are used.”³⁷

Blockchain

I will briefly mention the technology of blockchain. Blockchain is technology based on the idea of encrypting a block of data (containing information) in such a way that the encryption reference in the next block is

36 Maharg P.(2014), Convergence and fragmentation: legal research, legal informatics and legal education, in *European Journal of Law and Technology*, Vol 5, No 3, 2014.

37 Maharg P.(2014), Convergence and fragmentation: legal research, legal informatics and legal education, in *European Journal of Law and Technology*, Vol 5, No 3, 2014 at p12.

dependent upon the specific information in the previous block, guaranting the integrity of the information in the data chain. The way in which the encryption works is based on algorithms that produce fixed length numbers (hashing). Bitcoin technology uses a particular variation of that, which is relatively pointless and very expensive in computing power and energy.

This blockchain technology has attracted interested for many different reasons. It has been associated with cryptocurrencies (both for the release of that currency and the verification of transactions in using it), and it is also touted as the solution for trade, decentralisation of the money flow, and a way of enabling consumers to trade in their own solar electricity.³⁸ Platforms such as Ethereum are actively researching ways to encode contracts so that aspects of the economy can be automated. Some of the reason that blockchain has attracted attention is for its potential to influence the money system, markets, infrastructure and utilities. It is not merely of interest to those who think it will provide the basis for legal platforms: its appeal is that it is intended to shake up the foundations for the economic and utility infrastructure that people work with. The law, and ASIC, has also taken a cautious interest in the associated cryptocurrencies and their use in initial coin offerings. The extent to which blockchain will create an infrastructure to allow access to information to be controlled, and for it to be immutable, remains for the future.

Blockchain has recently been prototyped by law firm Corrs for use in real estate transactions, particularly outside of Australia where title deeds and chain of title is still in use.³⁹

For the purposes of this paper, I draw attention to the potential use of blockchain for the integrity of information transfers within the legal system. The Courts in Western Australia currently permit access to Court information using an eCourt Portal.⁴⁰

38 A matter of interest to local start-up company PowerLedger.

39 Corrs helps drive breakthrough Ethereum blockchain transaction. *Corrs Chambers Westgarth*. Published 15 June 2018. <http://www.corrs.com.au/news/corrs-helps-drive-breakthrough-ethereum-blockchain-transaction> (Last Accessed 20 June 2018). See also Smart Legal Contracts on the IBM Blockchain Platform – by Clause. *Artificial Lawyer*. 20 June 2018. <https://www.artificiallawyer.com/2018/06/20/smart-legal-contracts-on-the-ibm-blockchain-platform-by-clause/> (Last Accessed 20 June 2018).

40 URL: <https://ecourts.justice.wa.gov.au/eCourtsPortal/> and see Conditions of Use at <https://ecourts.justice.wa.gov.au/eCourtsPortal/Home/ConditionsOfUse> (Last accessed 13 June 2018).

To the extent that the Courts are using electronic technology to transfer information, there is no reason why it cannot incorporate blockchain ideas to verify the times of lodgment of documents. That is a purely administrative use of the technology, but as the Court registries are transaction-based, there is potential for application there.

The unexplored areas of information technology for the Courtroom environment

There are at least two areas where greater attention to information, and information technology, can assist the Courts and judges in what they do.

The first concerns case management. The ‘case management’ system arose out of a situation where cases that were not under the close watch of judicial officers, and were in the hands of the parties, could experience great delays. The present system in the Supreme Court makes registrars responsible for Case Management, though this may be referred to a judge.⁴¹ At case management hearings, programming orders (‘directions’) can be made. It is largely a housekeeping and reminder system. The judge has some knowledge of the case, but it is still driven by the focus on the sequential progress of a case through defined stages. Until the issues have been resolved and the matter approaches trial, there is not usually close attention to representing the state of preparation as it might look at trial. That is, interlocutory steps are not the subject of substantive ‘progress reports’, mainly because it has not been considered appropriate, and it has been considered too interventionist, to comment too strongly on the state of a party’s preparation for trial, but only on the evidence produced at the trial itself. If a party cannot successfully bring a summary judgment application against the other, then testing of the case usually awaits trial.

What’s needed is a scale showing relative progress, that functions as a barometer and a map. As items are submitted or information is provided, the progress chart updates. It is not based on time, but on substance.

⁴¹ Supreme Court of Western Australia. *Consolidated Practice Directions (2009)*, PD4.1, para 5. Available from URL: http://www.supremecourt.wa.gov.au/files/Consolidated_Practice_Directions.pdf (as at 7 May 2018). Last accessed 13 June 2018.

The second area is concerned with how judges obtain information at trial, and then write their judgments. The Court's expectations can be gleaned from the current Consolidated Practice Direction of the Supreme Court.⁴² The form of information provided at the start of the trial, including witness statements, document bundles, lists of documents and so on, has historically arisen because this assists the judge with the conduct of the trial, and for obtaining information in categories that reflect the conception of what a trial is: a place for considering evidence (witnesses, documents), and propositions about the law (pleadings, statements of material facts, submissions, references to case authority and legislation).

The categories of items that are needed for preparing for trial are containers, or libraries of information on specific topics. They are partly in the form they are because it is convenient to deal with each one discretely as the need arises. The task of consolidating, distilling and analysing how that information fits together is left to the minds of the lawyers and the judge. Each side will make addresses, or submissions, designed to resolve how the information can be expressed in the language of law, legal principles and facts. This is an illustration of legal reasoning in practice.

The system works well enough, mainly because there is no expectation for the forms of the information to be part of a continuous flow of information from the initial preparation to the end of the trial in the form of a judgment. However, if we wanted to visualise the path from ignorance to judgment, then the structure of the information would need careful consideration. Ultimately, it would require lawyers to be far more explicit about how they can represent the information in legal reasoning.

Given the novelty of thinking about this area, it is hard to discuss these things in abstract terms. What is needed is an illustrative database that is not based on documents, but on the kind of information that lawyers use. We immediately encounter the difficulty that there is a perceived complexity about

⁴² Supreme Court of Western Australia. *Consolidated Practice Directions (2009)*. Available from URL: http://www.supremecourt.wa.gov.au/files/Consolidated_Practice_Directions.pdf (as at 7 May 2018). Last accessed 13 June 2018.

how to represent the facts and the law, and even about the nature of law itself. It is little wonder that these issues about information have been avoided, because they seem to involve philosophical questions that have not readily been answered.

Some possible ways of designing new media for legal information

There are some possible clues to the way forward. The first is that lawyers are capable of representing information in a summary, graphical representation, and not merely in text. This suggests that there is a level at which knowledge can be encapsulated, though it is hard to generalise about what form that encapsulation should take. This is the stumbling block for traditional legal reasoning and philosophical enquiry: the goal of trying to come up with a rule-based scheme that describes how law should be classified has led to awareness of inconsistencies and findings that the system is inadequate.

The traditional medium of writing has long been used by lawyers. Within a document, however, there are no 'containers' as a computer might use to hold discrete blocks of information. The nearest thing in traditional media is the paragraph, as a unit of thought. Paragraphs are traditionally separated by a line space, and in legal documents, might also contain a clause number. However, Word Processors are not built to permit a paragraph to be the 'unit' in an informational sense. No work is done by the Word Processor on the basis that a paragraph is to be a unit of reasoning.

From a design perspective, the limitations of Word Processors influence the way lawyers approach their work and how they conceive of their own knowledge management. For example, Word Processors and documents are conceived as objects translated from paper media into electronic form. A Word Processor achieves the same goal as scanning, though the contents can be altered. However, the result is a container full of paragraphs. Lawyers work with paragraphs and clauses, and not at the scale of a document.

One consequence of this in commercial practice, for example, is that lawyers start to create their own clause libraries, and store them in other Word

Documents, or in their own personal folders. To try and overcome this, a 'Knowledge Manager' might try and create a library, or put these documents containing clauses into a central document management system in which all lawyers have access to them. Just over ten years ago, national law firms were choosing to provide access to these external clause libraries⁴³, and even to precedents⁴⁴ by including a toolbar and button on their Word Processors. In other firms, there are macros written that provide links from the Open/Save functions within the Word Processor to the external document management systems. Some firms use document assembly programs, and these may have their own way of creating templates, which are then generated, and sent to the Word Processor as a finished document, for further editing.

The Court system works with 'word-processed' documents in the same way. That is, it (or judges) expects Witness Statements or Pleadings to be prepared on Word Processors and provided in searchable form, or at least a scanned PDF version of these documents. In either case, the document is a container but the internal information has further structure imposed by the paragraphs. The remainder of the contemporaneous documents obtained by the parties are usually expected to be put into an 'electronic data base', and somehow assimilated into the factual information. It is rare that a chronology (central narrative of events in sequence) is prepared that is also capable of being used as an electronic map of the case, the law and the evidence as it is considered.

The limitation of both paper and electronic (word-processed documents) is that they are primarily written with the assumption they will be read, and that further manipulation and communication of the information will occur using traditional reasoning, thereby breaking the flow in representation of the information in a consistent form, and in the same electronic medium. For example, a judge is unlikely to think that a witness statement will be used directly as part of the judgment, and only rarely will descriptions of specific pleadings find their way into a judgment. Rather, the witness is considered a source of information, present at a trial, and information within documents is

43 Parson, M. *Effective Knowledge Management for Law Firms* (2004). Oxford University Press, page 147.

44 Parson, M. *Effective Knowledge Management for Law Firms* (2004). Oxford University Press, page 145.

often used to facilitate the memory of the witness. Transcript (itself sequential and not structured by fact and issue) will be separately considered and woven back into the submissions of the parties.

The mechanical way in which lawyers, regardless of the technology used, have approached trial preparation is reflected in the contents of paragraph 23 of SCWA Consolidated Practice Direction 4.1.2, as follows:

“23. For some time, the Court has actively discouraged the practice of including too many documents within the trial bundle. However, the inclusion of unnecessary documents continues to be a common practice.”⁴⁵

This has then led to this change in the order in which practitioners are required to prepare the documents (i.e. the relevant containers for information):

“24. (a) The previous practice of requiring the trial bundle to be prepared in advance of the witness statements will be discontinued. Rather, the usual order of pre-trial directions will require witness statements to be prepared referring to documents by their discovery number (without copying the documents referred to in the witness statement). After the trial bundle has been prepared, the parties will be directed to provide the court with another copy of each witness statement, annotated so as to show the trial bundle reference in respect of each document referred to in the statement.”⁴⁶

The real point of interest, however, is that the structure of information for trial, and the connections between the different types of information and their sources, is often a neglected area of attention. This suggests that there is some room for improvement in the way that lawyers pay attention to the information that they work with, which is clearly of importance if we are considering ways to design new ways of representing that information and its internal connections. The use of bundles as ‘containers’ for information is clearly not sufficiently connected to the objective of a trial to motivate enough practitioners to structure information so that form and content are suited to its ultimate purpose.

45 Supreme Court of Western Australia. *Consolidated Practice Directions (2009)*, PD4.1.2, paragraph 24(a). Available from URL: http://www.supremecourt.wa.gov.au/files/Consolidated_Practice_Directions.pdf (as at 7 May 2018). Last accessed 13 June 2018.

46 Supreme Court of Western Australia. *Consolidated Practice Directions (2009)*, PD4.1.2, paragraph 24(a). Available from URL: http://www.supremecourt.wa.gov.au/files/Consolidated_Practice_Directions.pdf (as at 7 May 2018). Last accessed 13 June 2018.

The central importance of witnesses at trial does not mean that what the witness says is unstructured, or will not be put into some kind of complex structure. A witness is expected to only refer to relevant information, and this question of relevance requires a connection with some conception of social reality that is recognisable in laws, and their subject matter. However, the way that witness, or people in general, conceive of facts naturally has some bearing on the representation of information in the judgment. The way in which specific events are singled out for attention by a witness will often reflect a shared understanding of the key events in the story, and these will then be consolidated into some form of conclusion about legally-relevant concepts by the lawyers and the judge.

Is there useful structure for legal information?

The scope for design and new technology in this area is to use information technology to bridge the gap between case preparation and case resolution, by providing a representational system for the information as it is gathered and updated. What would be helpful is a data structure for legal information that tracks information in the preparation of a case through to its conclusion. To do this requires some thought as to how legal information can be represented, not just in information technology, but in a conceptual sense as well. It might seem difficult to generalise about this, as the traditional way of representing information in submissions is to try and incorporate logical statements into paragraphs, or for paragraphs to contain related logical statements. Further, sometimes relevant facts are referred to in proximity to the logical statements they are used in, and at other times they are included in a separate document as a general reference for that kind of information.

Should the structuring of information about the law or the facts occur before the trial or before a witness takes the stand? It is an essential part of the case preparation that it does so. The pleadings and the opening addresses in a trial are a theory as to how the law and the facts can be combined. It is possible to sketch out the conceptual logic for the case in a hierarchical manner: this is itself evidence that the complexity of facts is reduced, for legal

purposes, into a conceptual scheme that adopts a certain perspective, or point of view.

Given these considerations, there is the prospect of a prototype form for representing a case, which connects the level of concepts that refer to laws with the intermediate concepts and conclusions, and finally to the source of relevant information about the world that must come from witnesses. This tree of information is capable of being represented on a whiteboard, as a diagram, and so it is capable of being simulated by some kind of electronic (software) equivalent.

What forms of software design for legal information are possible?

Some early research in computer science was directed to how computers might try and 'reason' with information. Even now, there is still an assumption that we can only use computers as a way of trying to automate or replace legal reasoning. Computer scientists have been busy trying to develop 'expert systems' or automated contracts (in which the rules of contracts are used as the basis for computational logic). This is still a work in progress, but the origins of these ideas are very firmly based in computer science, rather than in a broad look at what kind of information is used by lawyers and how it is represented, and in what context.

Even if the software cannot manipulate and engage in 'reasoning' with the data, it is still possible to construct a representational system that provides both structure and content, which facilitates clearer and more efficient communication of the structure that has emerged from legal reasoning. This system cannot be based on the traditional containers like 'witness statements', 'statements of fact' or 'lists of authorities', because these are mostly the tools of legal reasoning, not the outcomes of legal reasoning. It should also not mirror the textual form of pleadings and submissions because these are containers for reasoning, not units of reasoning.

Generic software tools used or adapted by lawyers for legal information

Many software innovations for working lawyers over the last 20 years have involved customised additions to Word Processing programs (often Microsoft Word, as a preferred product for many law firms, and sometimes WordPerfect). This has included toolbars⁴⁷ to link the word processor to document management libraries. Now there are even Word add ins for SmartClauses.⁴⁸

Word Processor-based document assembly systems have been developed that enable some variables and rules to be included within Word Documents that enable selection of alternative paragraphs or data insertion before output.⁴⁹ In law firms or business, document assembly programs have sometimes gained favour when there is high-volume repetitive work without too much need for change. The use of such systems removes the freedom of individual practitioners to act in the role of author, so a system that requires constant tweaking of precedents with an automated system is not conducive to personalised legal drafting favoured by many lawyers.

Some other recent innovations within the Word Processing environment have included automated lookup for relevant information as someone is preparing a document, but these can become annoying if they repeatedly prompt with information not needed or not appropriate.

Other previous attempts to merge information and content have included dynamic web pages (in which data is inserted) or document assembly programs (using data merge, or sometimes code within a word processor). The use of structured, relational database systems and dynamic document output based on often requires significant structuring of information to occur to enable a template document to be created. It also requires a scheme of representing legal information that usually involves sustained concern for legal ontologies that few academics have time or interest in.

47 Parson, M. *Effective Knowledge Management for Law Firms* (2004). Oxford University Press, page 147.

48 See <https://github.com/accordproject/cicero-word-add-in> (Last accessed 20 June 2018).

49 For example, HotDocs.

The practical solution for classifying legal information (the subject of legal knowledge management) has often been to use subject-based classifications (like in legal knowledge services), or search-based schemes. These are conceptually distinct from the kind of structured knowledge schemes for practical purposes using structured, relational database systems. In that respect, its use has been rare in educational contexts (if at all). In some law firms, wikis or the use of intranets for content management (collaborative web-based systems) has been used as a kind of shared knowledge resource, that grows and evolves into a topic-based system. The model for this kind of information is still the library-focussed, research based system.

With the emergence of collaboration software like Slack and Yammer (often developed in other contexts such as software development), there are opportunities for collaboration and the sharing of knowledge through individuals, and the attachment of relevant information into a communication channel or in the relevant thread of conversation. These systems may be able to utilise search to find relevant information, but as a whole, information structures cannot be visualised directly.

Software tools for clients/the public and the startup market

Recent interest in developing software applications with a legal focus has focussed on a perceived market for self-help applications, on phones, and for providing documents or contract reviews without legal intervention.

The promotions for many of these start-up companies focus on ‘design thinking’ and ‘machine learning’ aspects of their products. Example products include ‘GetJuro’⁵⁰, offering access to legal documents.

However, the challenge when looking at information being promoted by startups (and there are many trying to attract attention through public discussions like those at Stanford’s Codex) is that it could be ‘vapourware’: a technology that may take years to actually become reality, or not become reality at all. As has been said recently in an ABC article detailing a

50 <https://juro.com/>

conversation with John Carreyrou, the Wall Street Journalist that investigated the Theranos (a private company in the United States) fraud:

““Ever heard of the term "vapourware"?

The term was coined to describe technology that was announced with great fanfare but never appeared — or appeared only many years later.

Startup founders "have to promise the moon" to investors, Carreyrou said, but it's only when they get the money that they can bring the promises they've made to reality."⁵¹

In Theranos' case, the company raised substantial funds, but it couldn't make its product a reality. Apparently it then took active steps to deceive the public and investors, and proceeded to pretend the technology had been perfected and was suitable for purpose.

A new software prototype for legal education and practice

I have been experimenting with a way of capturing both the conceptual structure of legal knowledge and the detailed content that might require words to express particular ideas or concepts. My prototype software application is intended to modify the assumption that a Word Processor needs to be the central tool or focus of our attention when we are thinking and using information. What if we like to work in different ways but want all that effort stored in the same place? The principal reason for doing so is to enable the outcome of legal reasoning, namely the structure that is to be learned and used, to be captured in a way that also enables related information to be stored in context. This is a concept-orientated application.

The goal of the application is to alter the word processing paradigm by focussing on the structure first, and then offering the text editor as an accessible function within the conceptual or data units of that structure. The user interacts with the structure first, and creates the structure, and then calls on the text editing features as and when necessary. The user can decide if the unit of reasoning or representation is a single proposition or a single clause,

⁵¹ See URL: <http://www.abc.net.au/news/science/2018-06-10/the-downfall-of-biotech-startup-theranos-and-elizabeth-holmes/9837064> (Last accessed 17 June 2018).

and then encapsulate these in a large unit, represented by a container on the screen. A word processor does not usually enable representations of information structure other than the paragraph or linear heading systems.

The application also differs from a common relational database because it does not rely on tables or linear storage of information, but allows the user to decide how to structure the information, and also provides a much more intuitive text editing interface. This is one of its main goals: to allow users to work with how they structure information, and also update textual information, in a flexible and efficient manner. It uses the concept of a 'box' or 'node' to contain units of information, which are able to be graphically manipulated as well as forming the basis for opening up screens for editing text.

The design goal for the application is not merely to modify the central focus of the word processor, but also to bridge the current gap that exists between the software systems, teaching tools or applications that have been designed as information silos: word processors, mind mapping software, powerpoint slides, whiteboard drawings, visio charts, SQL databases, intranets, content management systems, document management systems, and document assembly programs. Unlike mind mapping software, the tool is not merely to represent how knowledge is structured for other purposes, but to retain that information and then to use the structure for actual work.

Design

I have a few final remarks on the design process. The first is that once a new idea or perspective gives rise to an idea, there is a lot of work involved to bring it to fruition, or to test if the idea is subject to limiting assumptions. In the business of supplying software, the luxury of building outside of requirements is often not one that can be indulged in, given the time and cost for the client. This is perhaps one reason why open source and community based software work can be successful in developing new products.

However, regardless of the business model, a new and untested idea will generally require prototypes to be developed. To immediately realise the

product or service by building it, step by step, into its final form without amendment is unlikely to be achievable, cost effective, or desirable. In the process of bringing parts of the idea to reality, lessons are learned and also new ideas are generated by being able to test and receive feedback on what works and what doesn't. This is an extension of the original stage of idea generation, but it is productive of a different kind of feedback, and it doesn't rely on memory or mental faculties to maintain a sense of what is the 'current' idea. In my view, for radically new products, prototypes are essential to continue the speculative design process until it reaches a point of stability, where requirements can be objectively defined.

The next point is that if you are designing software for general human use, the interfaces must not impose too much uncomfortable structure on the user. What is comfortable structure is capable of different realisations, but one of the guiding rules I use is to ask whether the interfaces and options available reflect mental processes and goals of the user. This is an interesting topic in itself, because there are many areas where mental processes are not fully understood, or people will be able to learn new ways of thinking about things simply by a new experience or by using a new tool. Some programmers have suggested making tools that only contain the features that are used most often.⁵²

There is a reason why users of software often ask "does it have this..." or "can it do this..." and that is familiarity. Some of those requests are based on what seems natural, but others are based on existing products that have defined a particular way of thinking or learning. A designer of a new product still has the opportunity to tap into other unrealised or unappreciated modes of thinking by constructing a visual representation of the grammar of thinking. If the interface allows someone to extend their conceptual structures or ways of thinking, it will seem more comfortable.

The final point is that the interface must be flexible enough to accommodate a particular grammar that is close to what the user uses, or is

⁵² For example, Wilson, G. Git, Graphs, and Software Engineering. (30 Sep 2017). URL: <http://third-bit.com/2017/09/30/git-graphs-and-engineering.html> (Accessed 25 June 2018).

capable of using, otherwise it will seem like an obstacle. There is a balance between designing something that is within reach of a user, and one that extends them too far, or requires too much conformity to a new idea to be immediately attractive. Interface design must be flexible for the user, but it also suggests that once users are familiar with one kind of interface, then it is less of a jump to introduce new ideas based on the same grammar. This is surely one of the reasons why users also oppose sudden changes in the interface design of familiar products like word processors.

Conclusions

The legal profession is at various stages in its progress from electronic technology to general legal information literacy.

The Court system is still at the stage of using technology to create a library of electronic information, but this has primarily changed the physical medium, rather than move the Courts toward a practical use of information technology.

The understanding of information technology that can efficiently and consistently represent legal information and legal concepts is still in its infancy, despite the frequent use of Word Processors, document management systems, electronic discovery and other technology. Part of the present difficulty is that the concept of the Word Processor, and its design, dominates the way in which information is captured and represented. The connections between word processors and graphical or database systems is weak and usually requires information to be manually reconfigured between one software application and another.

The units of reasoning for communication between software information systems (for example a document management system, or a Word Processor.) are often at the level of the container, so that there is no real connection between the information within each system. The document management system is a way of storing and retrieving the information at the level of the document, but it does not distinguish between documents and their contents.

A clause library, for example, is often saved within a Word Document because a document management system would treat a 'clause' in the same way as a complete Word document.

Within the legal education environment, the way in which legal information is structured for communication is often left to the design of textbooks and whiteboard representations by lecturers and tutors. There is no general discipline of analysing how these forms of information can be combined and used as part of an information system, that could then be used to design technology.

There is an opportunity to design and use representational systems for legal information that focus on legal concepts and information structures, to facilitate higher-level reasoning. If these systems can differentiate between the relevant elements that are stored in traditional 'containers', they will be able to achieve greater flexibility for authors to write and store legal information in a way that assists with communication, education and re-use.