

Utilising AI in the legal assistance sector

Testing a role for Legal Information Institutes

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ABSTRACT

The use of artificial intelligence (AI) in law has again become of great interest to lawyers and government. Legal Information Institutes (LIIs) have played a significant role in the provision of legal information via the web. The concept of 'free access to law' is not static, and its principles now require a LII response to the renewed prominence of AI, possibly to include improving and expanding free access to legal advice.

This paper proposes, and proposes to test, one approach that LIIs might take in the use of AI (specifically, 'decision support' or 'intelligent assistance' (IA) technologies), an approach that leverages the very large legal information assets that some LIIs have built over the past two decades. This approach focuses on how LIIs can assist providers of free legal advice (the 'legal assistance sector') to serve their clients. We consider the constraints that the requirement of 'free' imposes (on both the legal assistance sector and on LIIs), including on what types of free legal advice systems are sustainable, and what roles LIIs may realistically play in the development of such a 'commons of free legal advice'. We suggest guidelines for development of such systems. The AI-related services and tools that the Australasian Legal Information Institute (AustLII) is providing (the 'DataLex' platform) are outlined.

CCS CONCEPTS

• **Information systems** → **Expert systems**; Wikis; • **Applied computing** → **Law**;

KEYWORDS

decision-support systems, legal information institutes, legal assistance sector

1 INTRODUCTION

The use of artificial intelligence (AI) in law, including in relation to decision-support systems, has again become a matter of great interest to both the legal profession and to government. The previous wave of enthusiasm for, and investment in, 'AI and law' from the early 1980s to the mid-1990s was to a large extent supplanted by the development of the World-Wide-Web and the

provision of legal information via the web. Legal Information Institutes (LIIs) and the Free Access to Law Movement (FALM),¹ played a very significant role in those developments [1]. What roles might LIIs play in this new AI-oriented environment?

The concept of 'free access to law' is not static, and has evolved over the past quarter-century [2]. The principles of free access to law now require a LII response to the renewed prominence of AI-related developments in law, which could include improving and expanding free access to legal advice, as part of 'free access to law', consistent with those of FALM's *Declaration of Free Access to Law* [3]. 'Freeing the law' is a continuous process.

This paper proposes, and proposes to test, one approach that LIIs might take in the use of AI (specifically, 'decision support' or 'intelligent assistance' (IA) technologies), an approach that leverages the very large legal information assets that some LIIs have built over the past two decades.² This approach focuses on how LIIs can assist providers of free legal advice (the 'legal assistance sector') to serve their clients. We consider the constraints that the requirement of 'free' imposes (on both the legal assistance sector and on LIIs), including on what types of free legal advice systems are sustainable, and what roles LIIs may realistically play in the development of such a 'commons of free legal advice'. We suggest guidelines for development of such systems.

The Australasian Legal Information Institute (AustLII) is providing AI-based services and tools (the 'DataLex' platform), which are described, including how they implement these guidelines. A decision support system on rental housing law is to be developed to implement, test and evaluate the above approach, with the DataLex platform being used by *pro bono* knowledge-base (KB) developers from a large law firm to develop the application, working in conjunction with a community legal centre that will utilise it, and a university research centre to evaluate the project.

2 DEGREES OF FREEDOM: TRAJECTORIES OF THE DIGITIZATION OF EXPERTISE

The 'Web 2.0' context since about 2004 creates a very different environment from the pre-1995 (pre-Internet, in popular usage) context of the first wave of 'AI and law'. This context makes it more feasible to talk about the collaborative development of free legal advice services based on AI. The reasons include the significant roles that collaboration, in the form of FOSS (free and open source software) and open content (exemplified by Creative

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¹FALM website < <http://www.falm.info/> > – FALM has over 60 members.

²Other LIIs which have built AI-based tools to complement their databases include CanLII/Lexum (now merged).

Commons licensing and Wikipedia) have had on the development of the Internet; the much greater sophistication of interfaces; and the possibilities of interaction between AI-based tools and huge amounts of free access legal content.

We can distinguish three types of digitisation relevant to the giving of professional legal advice: representation of information used by experts; representation of expertise and its general application; and application of expertise to individual situations. These categories overlap in reality, but these distinctions enable us to consider more precisely [4] how likely is it that each category will become part of a 'commons of legal expertise'.

(I) *Representing Expert Domain Information.* 'Raw' (primary) information used by experts is the most likely aspect of expertise both to be digitised and to become part of the commons. Databases of primary information essential to legal professionals (legislation, treaties, court decisions etc) are already substantially digitised and available online, and with increasing utility (eg smarter retrieval systems, and smarter data structures). In many countries substantial amounts are available as commons, at least for free access and often as open content, usually via government sources. In a few dozen countries such as Australia, free access 'legal information institutes' (LIIs) aggregate this data and add value to it, making it a resource used by professionals and the general public alike. Even though some primary information is only available commercially, in less than 25 years since the start of widespread availability of such data via the web, the increase in free availability is extraordinary, and is tending toward a comprehensive commons.

(II) *Representing Expertise in General Form.* When professional expertise is represented (or embodied or reified) this is usually in a generalised form which may or may not be applicable to an individual situation where expertise is needed, because of the enormous variation of individual situations which may arise. It is up to the reader (usually the correct term) to apply the expertise to the individual situation. Legal professionals represented their expertise in many ways prior to the Internet – in textbooks, journal articles, encyclopedias, and in very significant, but more mundane, forms such as citators and checklists (often as supervisors of non-professionals). The economics of publishing meant that such reification of expertise could rarely be provided as a commons, and instead it usually became an economic asset of a commercial publisher and an author.

The Internet changes some but not all of these factors. Expertise remains a very valuable asset which many professionals are reluctant to embody in any form of commons. However, the last quarter century has revealed revolutionary potential which is only becoming apparent through the accretion of successes, including free access repositories of current scholarship, archives of published journals, changing academic funding requirements, peer-reviewed free content, viral licensing; crowd-sourcing; collaborative editing by closed professional groups; and automated substitutions for expertise. A 'closed wiki' model, where content may only be edited by professionals may be most suitable for law, because of its emphasis on authority. Successful commons examples developed by AustLII including multi-author guidebooks [5], and automated citators performing to professional levels [6].

The results demonstrate that it is becoming viable for professionals to control the representation of their own expertise, as a commons.

(III) *Applying Expertise to Individual Situations.* It is the third category, the application of expertise to individual situations (the problems of individual clients) via programs, which is seen widely as a major threat to the future of professionals and professions [4]. At present, the number of convincing examples and their commercial viability do not make it inevitable that there will be generalised dire results for professions. To understand the likely implications, it is necessary to distinguish at least three types of the programmatic applications of legal expertise: human expertise embodied in knowledge-bases which interact with programs; embedded knowledge in artifacts; and machine-generated expertise. The first is most relevant to the provision of legal advice. The question is whether, in those areas where legal expertise can be effectively captured in knowledge-bases to be used in decision-support systems, can they be developed as a commons, or only as commercial products?

3 AN ALTERNATIVE FUTURE: A COMMONS OF LEGAL EXPERTISE

Although there is as yet no obvious tendency toward commons in relation to the three categories of software-based application of expertise to individual cases, we argue that this can be encouraged to develop. Tools for knowledge engineering and for creating machine-generated expertise are available as FOSS and are of high quality, but the communities of users necessary to develop applications (similar to the FOSS or Wikipedia communities) have not yet developed. We argue that such collaborative alternative could arise primarily from those organisations that seek to provide free legal advice, and be driven largely by their needs, but could expand to involve other participants in the legal profession.

3.1 The providers and constraints of free legal advice

There are many situations where, at least in a country like Australia, our social expectation is that legal advice be provided without cost to the public, whether as consumers, citizens or (sometimes) litigants. The organisations most likely to be involved in providing such free³ legal advice are quite diverse, and include government legal aid providers, community legal centres, government and community consumer advice centres, specialist NGOs in law-related areas, government agencies giving advice relevant to their functions, and 'chamber magistrates' in courthouses. The legal profession, through state and regional Law Societies and advice centres they provide, and through the extensive *pro bono* schemes, also contributes. University law schools, through their involvement in community legal centres and internships in other organisations, are potential sources of contributors who often have high computing skills. Bodies assisting the legal profession as a whole to avoid liability problems, such as some legal insurers, might also wish to participate.

³'Free' entails 'free from surveillance', a test which some commercial providers of ostensibly 'free' services will fail: see [2].

A common factor for most of these providers of free legal advice is that, if they choose to develop AI-related tools to assist their work, they will usually have to do so within very constrained development and maintenance budgets for software or applications. They are not in a position to pass on such costs to clients, or to purchasers of applications. Government or other grants for such developments may provide up-front development costs (at least while the hype cycle for AI is rising) but will rarely cover ongoing maintenance for applications as the law changes, or technical issues arise. Bringing in out-of-house consultants on specialised software problems, or as ‘knowledge engineers’ in relation to particular legal domains, is likely to be very expensive. It is therefore a reasonable assumption that, at least in the medium to long term, providers of free legal advice will have to work within significant financial constraints that are more severe than those experienced by commercial providers.

The implications of these constraints – limited institutional range of providers, and limited financial resources – affect the types of legal advisory systems that it is practical for this sector to develop and support.

3.2 Free legal advisory systems: Guidelines for sustainability

We have previously set out and justified our views on what approach to the use of AI tools is most likely to be of value to a free legal advice service ([7], at 3.1-3.16). These guidelines are based on the assumptions discussed above of the likely limited financial and personnel resources of such a service, and on our own lengthy experience with the DataLex project. They are implemented in the DataLex platform discussed in the following section.

First, the ‘AI and law’ systems that such a service could be expected to find useful are those that justify their answers at least in part in terms of the formal sources of law. These constraints will mean that only some types of ‘AI and law’ tools are suitable to their needs.

Second, looked at from the user perspective, which could be that of an employee of a free legal advice service, or perhaps one of its clients, what counts as a useful level of legal expertise is relative. A system may be valuable to a class of users even though it has a relatively low point at which it admits that a problem is beyond its expertise, and it may serve as a method of triage. In any event, it is not realistic to try to build legal expert systems that encapsulate all the knowledge necessary to answer user problems. The more realistic aim is to build decision support systems, in the use of which the program and the user in effect pool their knowledge/expertise to resolve a problem. Expertise can and should be represented and utilised by programs in many ways. This means the knowledge-based system (the knowledge representation and the program) should not be ‘closed’: it must be integrated with text retrieval, hypertext and other tools which allow and assist the user to obtain access to whatever source materials are necessary to answer the parts of a problem dependent on the user’s expertise. The result is an integrated decision-support system.

Third, looked at from the developer perspective, the key contextual factor is that user-organisations such as free legal advice services, will probably need to both develop and maintain their own knowledge-bases, as the only available domain experts.

The systems which non-technical legal domain experts are most likely to be able to develop and maintain are those which represent legal knowledge in a way which has a reasonably high level of isomorphism (one-to-one correspondence) with the legal sources on which it is based, where the representation is reasonably close to natural language, and where it is not necessary to prescribe the order(s) of the procedural steps necessary to reach a solution to a problem, but only to declare what legal knowledge is available, and leave it to the system to undertake the steps to apply that knowledge.

Fourth, correctly choosing the type of problem where ‘AI and law’ techniques are most likely to be appropriate is essential. Problem areas based on legislation, or procedural steps, and where there is complexity, will probably give the best results. Problems involving multiple instances of one factor increase logical difficulty. If it is administratively possible to have multiple organisations collaborate to build and maintain a legal knowledge base, this may increase sustainability.

3.3 The likely roles of LIIs

Fifth, we conclude that free access legal information institutes (LIIs) are unlikely to be the builders of legal knowledge-bases in particular legal domains, because they do not have the necessary in-house expertise in legal subject domains. They have neither the client-base that provides a continuing need for such expertise, nor the funds to retain such expertise from outside (at least not on a continuing basis, beyond an initial grant). As a result, LIIs are much more likely to be the providers of tools by which such knowledge-bases are built, the free access legal infrastructure within which they are built, and education and support for those organisations that use their tools and services to build and maintain subject-area applications.⁴ In light of that conclusion, we now move to the tools and services that AustLII is building.

4 AI IN A LII: AUSTLII’S DATALEX IMPLEMENTATION

The Australasian Legal Information Institute (AustLII), through its DataLex project ([7] at 2, [8]) is developing tools and infrastructure so as to implement the above ‘sustainable legal advisory systems’ approach to AI and law in the context of a LII. This platform includes five main elements, rectangles in the following diagram (Figure 1). The features of each are then summarised.

4.1 The DataLex inferencing software

The DataLex inferencing software⁵ primarily carries out rule-based reasoning. It has the following key features:

- Support for backward-chaining and forward-chaining rule-based reasoning. Rules are expressed in a declarative form.
- Rule-based reasoning is supplemented by procedural code, where procedural steps in reasoning are needed.

⁴Length constraints preclude a survey of what projects other LIIs are undertaking.

⁵The DataLex inferencing software was originally written by Andrew Mowbray, as y-sh (‘y-shell’), with subsequent further layers by various authors including Simon Cant and Philip Chung, to enable web-based operation.

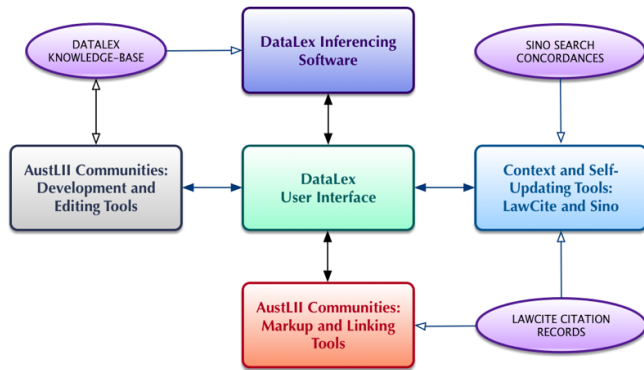


Figure 1: Components of AustLII’s DataLex legal inferring platform.

- Rule based reasoning is also supplemented by example-based (or ‘case-based’) reasoning,⁶ where needed.
- Rules of any degree of complexity may be written, using propositional logic.
- A quasi-natural-language knowledge-base syntax (ie one resembling English as far as is possible) is used to declare rules (and examples).
- There is no separate coding of questions, explanations and reports, because they are all generated automatically from the declared rules, in dialogues generated ‘on the fly’ when the system is in operation. This default operation can be customised where special circumstances require.
- Isomorphic (one-to-one) relationships between the knowledge-base and legislation is facilitated, and assists in debugging and updating.
- The previous three elements allow easier development, debugging and maintenance by domain experts (lawyers), without involvement by software experts or ‘knowledge engineers’.
- Collaborative development of larger applications across distributed knowledge-bases is supported.

An extract from the ElectKB knowledge-base [10] is shown in Figure 2.

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RULE Commonwealth Electoral Act 1918 - Section 163(1) PROVIDES
  section 163(1) of the Commonwealth Electoral Act 1918 is satisfied ONLY IF
  section 163(1)(a) of the Commonwealth Electoral Act 1918 is satisfied AND
  section 163(1)(b) of the Commonwealth Electoral Act 1918 is satisfied AND
  section 163(1)(c) of the Commonwealth Electoral Act 1918 is satisfied

RULE Commonwealth Electoral Act 1918 - Section 163(1)(a) PROVIDES
  section 163(1)(a) of the Commonwealth Electoral Act 1918 is satisfied ONLY IF
  the age of the nominee IS GREATEREQUAL THAN 18

RULE Commonwealth Electoral Act 1918 - Section 163(1)(b) PROVIDES
  section 163(1)(b) of the Commonwealth Electoral Act 1918 is satisfied ONLY IF
  the nominee is an Australian citizen
    
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Figure 2: Extract of a DataLex knowledge-base (or rulebase).

⁶PANNDA (Precedent Analysis by Nearest-Neighbour Discriminant Analysis); see [9] for details about the FINDER (finders’ cases) application of PANNDA.

4.2 The AustLII Communities environment – integrating AI with a LII

The AustLII Communities environment is used to link automatically both knowledge-bases under development, and advisory systems when in operation, with all of the free access legal materials provided by a LII. The hypertext links in the above knowledge-base extract are inserted automatically, using AustLII’s *findacts* software, into the knowledge-base as it is written and saved. Further examples of links from applications in operation are given below.

4.3 The DataLex knowledge-base development tools

The DataLex development tools [11] are situated within the AustLII Communities infrastructure. They use a familiar wiki-like editing interface for development and maintenance of knowledge-bases (KBs). Development is within a closed wiki environment.

4.4 The DataLex user interface

The DataLex user interface uses the DataLex software and knowledge-bases, the linkages provided by the Communities environment, and user input, to provide legal advisory systems in operation.

From Figure 3, it can be seen that some of the features of the interface include:

- Questions, Facts, Conclusions, and Reports are all generated from the knowledge-base and user-provided facts, in understandable form, and are available on screen at all times.
- Facts can be deleted (‘Forget?’), and questions then re-asked; Conclusions can be explained (‘How?’); and reasons for Questions requested (‘Why?’), generated in the same manner.
- The system also uses all information available to it, from the knowledge-base and user-supplied facts, to suggest other relevant Related Materials.

As the consultation continues, conclusions are shown on the right-hand side. Selection of a numbered conclusion results in a ‘How’ explanation of that conclusion being presented, as shown in Figure 4.

At the end of the consultation, a composite explanation of the final result, and of all the steps necessary for it to be reached, is displayed and may be exported to word processing or other programs for use.

4.5 The LawCite citator and SINO search engine – updating and expanding advice

SINO is the open source search engine, developed by AustLII [12], used to operate AustLII and other LIIs. The LawCite citator [6] is an automated international citator for case law and legal scholarship, accessible to end-users free of any user charges. It is developed and maintained by AustLII in conjunction with a consortium of participating legal information institutes (LIIs). LawCite currently contains index records of the citation histories of over 5.7 million cases, law journal articles, law reform documents and treaties, going

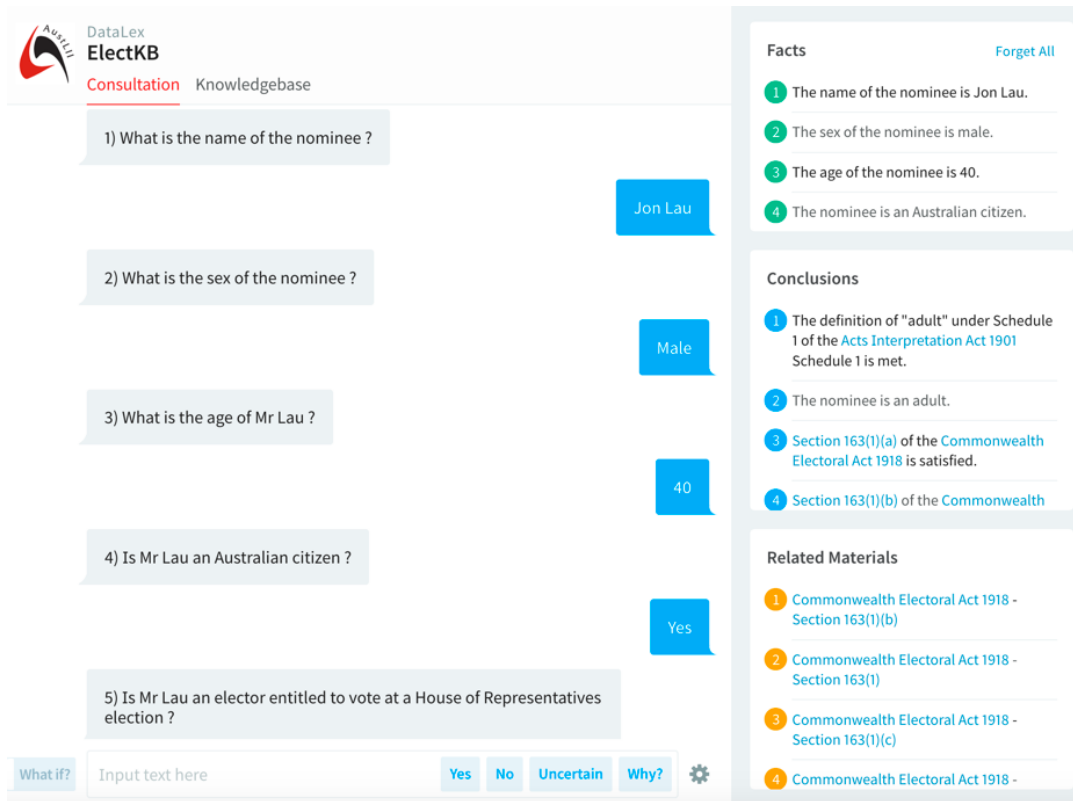


Figure 3: DataLex user interface features: Consultation, Facts, Conclusions, Related Materials.

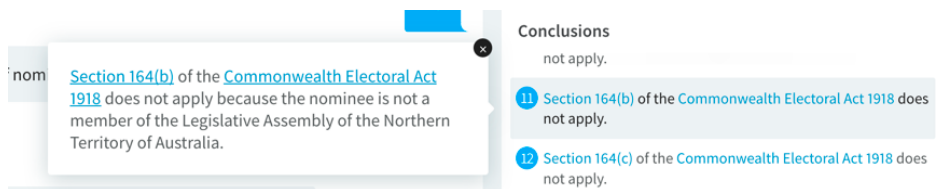


Figure 4: DataLex 'How' explanation during consultation.

back to the 1300s. It includes citation records in significant numbers from court decisions in 75 countries. It is integrated fully into the operations of AustLII and other LIIs that use it. The technical details of LawCite are explained elsewhere [13].

The significance of both LawCite and SINO within the DataLex project is that they provide a means of (in effect) expanding the scope of a knowledge-base by providing users with access to knowledge which is not yet encoded within the knowledge-base. Examples are as follows, from the ElectKB knowledge-base [10] concerning disqualification for eligibility for election to the Australian federal Parliament:

- (a) Wherever the term 'foreign power' appears in a consultation dialogue, it does so as a hypertext link which triggers a search over AustLII for all occurrences of 'foreign power' in the context of s 44 of the Australian Constitution (Figure 5).

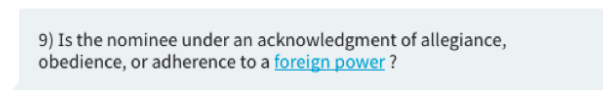


Figure 5: Embedded search link to 'foreign power' during DataLex consultation.

The user is then given a list of cases, journal article etc, ranked in default by likely order of relevance, to enable them to determine the correct answer to the question (Figure 6).
 (b) Wherever a citation for a case appears in a dialogue, it will be linked automatically to the text of the case (where it is a neutral citation), with a further link to the LawCite record, as in the following example (Figure 7).

By Relevance	By Citation Frequency	By Database	By Date	By Title	<input type="checkbox"/> Show Excerpt
Collapse multi-sections Show all sections					
Re Canavan; Re Ludlam; Re Waters; Re Roberts [No 2]; Re Joyce; Re Nash; Re Xenophon [2017] HCA 45 (27 October 2017)					
High Court of Australia (AustLII) · 27 October 2017 · 170 KB · LawCite ★★★★★ Relevance: 100%					
Sue v Hill [1999] HCA 30; 199 CLR 462; 163 ALR 648; 73 ALJR 1016 (23 June 1999)					
High Court of Australia (AustLII) · 23 June 1999 · 454 KB · LawCite ★★★★★ Relevance: 75%					
Sykes v Cleary [1992] HCA 60; (1992) 176 CLR 77 (25 November 1992)					
High Court of Australia (AustLII) · 25 November 1992 · 186 KB · LawCite ★★★★★ Relevance: 74%					

Figure 6: Search results from embedded search link.

This will help determine whether or not the situation is similar to *Sykes v Cleary* [\[1992\] HCA 60](#).

Figure 7: DataLex automated links to case law references.

The user is able to note from the LawCite citation record whether that case has been considered by other cases subsequent to the knowledge-base being written, and to check for any resulting changes to the law. No knowledge-base can be updated as frequently as the law might change,⁷ and this is particularly so when they are subject to the constraints discussed in part 3. For example, the LawCite record for this case alerts the user to recent cases considering *Sykes v Cleary*, that may not yet be taken account of in the knowledge-base (Figure 8).

It should be clear from these examples that updating a legal knowledge-base through links and searches requires access to the case and legislation content of a whole legal system, updated continuously. For providers of free legal advice, the most feasible source of such information is a free access legal information institute (LII).

5 A COLLABORATIVE PROJECT FOR LEGAL ASSISTANCE LAWYERS AND THEIR CLIENTS

The next steps of this project will be (once funding is secured) to test the approach advocated in this paper will utilise AustLII's DataLex platform to demonstrate how *pro bono* legal assistance programs can result in development and use of shared AI-based legal resources ('apps'), integrated fully with AustLII's databases. The application to be developed concerns NSW tenancy law (particularly the *Residential Tenancies Act 2010*), an area of

⁷A knowledge-base maintained by a legislature is a partial exception (would not include case-law changes). Automated programmatic updating is a formidable task, and unlikely.

significant unmet legal need, as documented in the Redfern Legal Centre (RLC) response ([14]) to [15]. There are four project partners:

- (1) AustLII is to provide (and further develop) the DataLex platform, including the inferencing software, Communities environment, and underlying legal databases on AustLII, plus software developer skills and knowledge, and project management.
- (2) The Pro Bono & Community Impact program of King and Wood Mallesons (KWM)⁸ is to provide lawyers under its *pro bono* program who will work with RLC to build a knowledge-base ('the application') in the tenancy law area, using the DataLex platform.
- (3) Redfern Legal Centre (RLC)⁹ is to provide legal staff and volunteers working in its tenancy advice practice, to utilise the application in its advisory work. It will provide feedback about both the application and the platform, so that they can be improved iteratively, to KWM lawyers and to AustLII developers. Once the application is tested by RLC, it and AustLII will decide whether a version of it can also be provided for direct use by the public, via AustLII and through links from RLC's website.
- (4) The Australian Pro Bono Centre (APBC)¹⁰ at UNSW is to provide an independent evaluation of the development of the application, and the outcome of the trial of its use. Based on this evaluation it will provide advice to AustLII to assist AustLII to develop a methodology by which the DataLex platform can be more widely applied in the *pro bono* field to support free access legal advice to the community.

The co-ordinating body for NSW Community Legal Centres has also agreed to examine how it can both assist legal centres sharing applications developed using this approach, and assist in the identification of which bodies in the legal assistance sector

⁸<https://www.kwm.com/en/au/about-us/corporate-responsibility/pro-bono>

⁹<https://rlc.org.au/>

¹⁰<https://www.probonocentre.org.au/>



Figure 8: LawCite records for *Sykes v Cleary*.

would be most likely to participate in the development of new applications.

6 CONCLUSIONS – WHEN IS AI FEASIBLE FOR THE LEGAL ASSISTANCE SECTOR?

In this paper we have identified why providers of free legal advice are likely to face significant constraints on the resources available to them to develop and maintain AI-based legal advisory systems, and the implications this has for the types of systems they are most likely to use. We have proposed guidelines which will enable development which is sustainable by the organisations likely to be providing such advice, and which will contribute to an expanding commons of legal expertise embodied in AI-based tools.

We have set out the approach that AustLII, through its DataLex platform, is taking to facilitate the development of such systems, and how the DataLex approach allows implementation of the guidelines for sustainable legal AI that we have proposed. We have outlined a collaborative project to build, test and evaluate both the general approach, and an application on rental housing law.

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