Current State of Automated Legal Advice Tools

Discussion Paper 1
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Authors
Judith Bennett, Tim Miller, Julian Webb, Rachelle Bosua, Adam Lodders
University of Melbourne
Scott Chamberlain
Australian National University

Contact
Julian Webb – julian.webb@unimelb.edu.au

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Executive Summary

1. This paper is the first from the Regulating Automated Legal Advice Technologies (RALAT) project supported by the University of Melbourne’s Networked Society Institute.

2. The project focuses on a cutting-edge development in legal technology: the automation of legal advice. It seeks to understand the practice settings in which Automated Legal Advice Tools (ALATs) are being adopted, issues regarding their effective management. It also explores the legal, regulatory, and ethical risks and consequences, and how these will shape access to delivery of legal services.

3. This initial paper sets out to provide the following:
   - A working definition of ALATs;
   - An overview of the current technology landscape;
   - An overview of the Australian legal landscape;
   - A description and evaluation of the current state of ALATs; and
   - An overview of regulatory issues emerging from the use of ALATs.

Examples of current ALATs already in the market are set out in Appendix A.

4. The paper briefly places ALAT developments in the context of advances in technology, specifically the emergence in the 2010s of a vigorous and qualitatively distinct ‘fourth wave’ of intelligent automation research. This has arisen through significant investments in hardware platforms with large processing power, new applications, increased system interconnectivity and enhanced data harvesting.

5. The Australian legal industry has not been immune from these trends. The paper first contextualises developments by describing the current legal services market. It highlights the market segmentation into corporate and private client sectors that affects patterns of investment in and take-up of new automation technologies. At the same time, the potential for technology to disrupt the market is highlighted including opening-up latent (currently uneconomic) markets and creating new areas and forms of competition.

6. ALATs are identified as a critical technology in terms of market disruption. The giving of legal advice is a central function of the legal profession. ALATs create opportunities, notably of commoditisation of advice-giving. The potential for automated legal advice to reduce costs and open-up latent markets is significant, particularly in the context of current debates around declining access to justice. But ALATs also highlight challenges to market incumbents across the industry, for example, as technical legal expertise becomes increasingly open to automation. US corporates like LegalZoom and Rocket Lawyer are examples of ways non-lawyer entities may seek to enter and disrupt traditional markets for smaller business and consumer legal services. Policy questions also arise as to the risks such disruptors may pose to consumers, and how regulation should respond (if at all).
7. The scope and scale of current ALAT development is discussed in section 4 with examples given in Appendix A. The paper seeks to classify ALATs by reference both to function and intelligent capability. Functionally, it identifies five subsets of technology:

- Specialised standalone technologies, such as legal chatbots, apps and virtual assistants,
- Enablers of legal advice such as legal automated drafting, legal document review and legal algorithms,
- Further enablers of legal advice such as legal data analytics and predictors, and legal artificial intelligence,
- Automation of legal advice with truly smart contracts, and
- Sets of ALAT technologies enabling NewLaw business models and legal technology companies.

In terms of capability, a range of technologies are found to exist from simple non-AI tools relying solely on hard-coded decisions through to “smarter” or “more intelligent” sophisticated technologies that use deep learning and can parse text, learn causations and correlations from data, and reason about these to make predictions.

8. We find that the market in ALATs is developing rapidly. Most applications have entered the market since 2014, with the greatest activity in the US – likely reflecting the greater availability of venture capital. ALATs are both new and at varying levels of sophistication, with the majority at the lower end of the intelligence scale.

9. The challenge to legal services regulation posed by ALATs is explored in sections 3 and 5 of the paper. Section 3 introduces the problem in terms of the wide definition of legal practice in Australia, which reserves legal work to the legal profession. This section also explains how regulation demarcates the provision of (unregulated) legal information from (regulated) legal advice-giving. This regulated boundary between information and advice could prove to be a critical zone of engagement, determining the impact of new market entrants, including unregulated disruptors. While controls on advice-giving have consumer safety justifications, the development of automated intelligence potentially changes the risk environment. To this extent, automation re-opens important questions regarding the scope and proper function of legal services regulation.
10. Section 5 details the ways in which ALATs create a number of specific issues for regulators and government regarding: the usability of the existing information/advice distinction; how quality of information and advice is to be assured; expectations of professional competence and related standards; the need (if any) for explainability standards, and the timing of any reforms. The section concludes by identifying three wider challenges highlighted by automation being uncertainties of the law, the consistency, reach (functional and geographical) of regulation, and the purpose of regulation. Most fundamentally, it suggests automation brings into stark relief the question whether the purpose of legal services regulation is to facilitate access to lawyers or access to law.

11. In conclusion, this paper seeks to both inform and raise the extent of debate as to the potential for ALATs to transform the delivery of legal services in Australia. It both complements and is distinct from recent profession-centric contributions, such as the NSW Law Society’s *FLIP Inquiry* (2016), the Law Institute of Victoria’s *Disruption, Innovation and Change: The future of the legal profession* (2015) and Law Society of Western Australia’s *The Future of the Legal Profession* (2017).

12. Phase 2 of the project involving qualitative research will seek to further discussion and inform policy-making by fieldwork with a range of stakeholders: members of the profession, regulators, ALAT developers and producers, and access to justice groups. In scoping that fieldwork, Section 5 highlights a number of critical questions for discussion:

   a. To what extent (if at all) is the legal information/advice distinction a barrier to legal services innovation?

   b. Conversely, is there a case for bringing ‘legal information’ substantively into legal services regulation? If yes, how might that best be done?

   c. What additional challenges to quality of advice are created by ALAT technologies? Are specific new mechanisms or approaches necessary or adequate to regulate the quality of automated legal advice?

   d. Should the duty of professional competence be expressly extended to include an obligation to stay up-to-date with relevant technologies? Are there other professional obligations that may need to be revised in the context of increased automation of legal advice?

   e. How (if at all) is automation of legal advice already impacting pricing and billing practices in the profession? How might it impact them in the next five years?

   f. Should explainability standards be devised for ALATs using sophisticated (‘black box’) automated intelligence? Why/why not?

   g. Are there critical areas of automation of legal advice that create risks for consumers such as where the separation between service provider liabilities under the general law (tort, Australian Consumer Law, etc) and professional responsibility under the Uniform Law or equivalent Legal Profession Acts?

   h. How should or could regulation overcome the problem that online services may be delivered from outside the regulator’s physical jurisdiction?
1 Introduction and Purpose

1.1 Context of the RALAT Project

The Regulation of Automated Legal Advice Technology (RALAT) in Australia project seeks to further the understanding of the practical and regulatory implications of specific new technologies supporting and providing delivery of legal advice. We refer to such technologies as Automated Legal Advice Tools (ALATs). There is currently widespread uncertainty regarding the potential of these advanced technologies, and their likely impact on legal practice and service delivery over the medium to longer term.

The project’s objective is to explore the emergence and development of ALATs, their impact, limits, and how they are transforming legal practice in Australia. The project particularly seeks to identify the issues ALATs raise for the current regulatory landscape. This research also begins to address concerns that much debate about the automation of legal work has not sufficiently engaged with the technical capabilities of systems when discussing how different kinds of legal work may be more or less “amenable” to automation (Remus & Levy, 2016).

To explore these themes and issues for ALATs, the project team is carrying out the following steps:

- Mapping of current tools for automated legal advice giving (this paper);
- Literature review to identify and review key themes and issues;
- Interviews with legal practitioners, regulators and vendors to understand the scope, operation and impact of ALATs;
- Analysis of appropriateness of the current regulatory landscape; and
- Making of recommendations.

The project seeks to better understand the technical development and practice settings for ALATs in order to: inform policy on regulation, ascertain ALATs impact, support effective management, and how they may shape access to delivery of legal services in an increasingly networked society. Additionally, the project will contribute to the broader debate surrounding the future of professional services across the economy.

1.2 The Team

RALAT is an interdisciplinary project with a research team drawn from the Melbourne Law School (Legal Professions Research Network), School of Computing and Information Systems, Department of Management and Marketing, and the Networked Society Institute (NSI) all at the University of Melbourne, together with ANU College of Law, Australian National University. The project has been financially supported through the Networked Society Institute’s Seed Funding Program.
1.3 Scope of this Paper

This paper is the first in the RALAT Project series. It offers an introduction to the technological and regulatory issues that are to be explored, delivers a preliminary evaluation of current ALAT developments, and provides a launch-point for discussions in the second, empirical, phase of the project.

In the following sections, the paper provides:

- A working definition of ALATs;
- An overview of the technology landscape;
- An overview of the Australian legal landscape;
- A description and evaluation of the current state of ALATs; and
- An overview of regulatory issues emerging from the use of ALATs.

It concludes with three Appendices providing the following information:

A. Examples of current ALATs;
B. Technology terms and definitions; and
C. References.
2 Overview of ALATs and state of technologies

2.1 What are ALATs?

This paper focuses on the current state of automated legal advice tools (ALATs); that is, technologies whose major purpose is “giving legal advice” as regulated by the legal profession. The rather circular quality of this definition reflects, first, that “legal advice giving” is itself a fuzzy concept. It lacks clear definition, even within legal professional regulation (see section 3.3). We recognise that technology can change not just the efficiency with which legal advice is delivered, but the way in which it may be bundled with other services (so that boundaries, such as between legal and business advice become more blurred), and, even more fundamentally, that technology may perform certain advice-giving tasks quite differently from human advisers. This of course reflects the extent to which advising, above a relatively basic level, requires capabilities that stretch, or are currently beyond the reach of software: for example, the capacity to factor-in complex considerations of interests, tactics and values, or the ability to engage in unstructured communication with others (Remus & Levy, 2016: 40, 65ff).

The emphasis on automation in our definition reflects the focus on technologies “by which a process or procedure is performed without human assistance” (Groover, 2014). This limits the scope of the study to the use of advanced cognitive tools and emerging technologies rather than existing process-based tools. While process automation “has been maturing quietly over the last decade and is now used for enterprise-scale deployments” that can assist in giving legal advice, “... intelligent automation, while still nascent, promises hugely transformative potential in the near future” (Deloitte, 2017).

In sum, by emphasising automated advice-giving, we include ALATs that use legal analysis, legal reasoning, and prediction functions:

- To give legal advice on their own;
- To give advice supervised or reviewed by a lawyer;
- To assist or augment legal advice given by a lawyer; and
- To offer limited or partial legal advice by unbundling transactions into smaller discrete tasks.

Advice-giving ALATs are currently at the leading edge of new information technologies and are still at a relatively early stage of adoption by lawyers and the legal industry. ALATs rely on advances in big data, interconnectivity and processing power combined with logic techniques variously known as artificial intelligence, intelligent automation, cognitive computing, natural language processing and machine learning. Examples are given in Figure 1 below. The scope and potential scale of ALAT use is uncertain as the underlying technologies are rapidly and often exponentially changing. We thus find a range of ALATs at different stages of sophistication (Appendix A).
Key terms used in this paper are explained here, others are in Appendix B. Artificial Intelligence includes several sets of technologies, applications and consequences. It is used here as an umbrella concept to encompass the AI ecosystem. Artificial refers to machines, and Intelligence is also used in a broad sense as to “learn, reason and act in a rational way” (Miller in Webb, Miller, Bosua, & Bennett, 2017). In this context it is important not to read too much into terms like intelligence or learning. As both Turing and Marvin have observed, intelligence is simply a name for any problem-solving mental process that we do not yet understand. Like the concept “unexplored regions of Africa: it disappears as soon as we discover it” (Copeland, 2017). Similarly, learning in a machine context does not necessarily imply a capacity for higher order cognition; it may simply indicate the functional ability of a system to improve its own performance of a specified task, over time (compare Surden, 2014).

Using artificial intelligence in this broad sense, this paper also examines ALATs as to their positioning on various dimensions that range from smart and smarter to the more intelligent programs that can teach themselves to learn, plan, and act “when exposed to new data in the right quantities” (Huff Eckert, Curran, & Bhardwaj, 2016).
2.2 A brief history of technologies

Artificial intelligence is not new. However, a review of the history of technology development shows the extent to which current advances are exponential rather than linear.

The 1950s saw the first wave of AI with McCarthy defining artificial intelligence as “the science and engineering of making intelligent machines” (McCarthy, Minsky, Rochester, & Shannon, 1955). Much research in this era took the view that computers could ultimately be made as intelligent as humans by mimicking and replicating the functions and processing structures of the human brain. This overly ambitious premise, and the limits of processing power, largely account for the limited advances in this period. Consequent frustration with lack of success, lack of scale and failure of assumptions led to a lull in AI research and funding during the 1970s. Interest in legal computing began in the 1960s, with the first strands of research into AI and the law in the 1970s (Nissan, 2017).

The 1980s saw a second wave of AI research with the success of expert systems designed as rule-based conditional logic operations using hand-coded knowledge. This approach was facilitated by the rise of the PC and client-server model. Workable legal expert systems were developed, with examples including Richard Susskind’s PhD (Susskind, 1987), his collaboration with Capper on Latent Damage Law, and Bench-Capon’s project creating tools to assist with frontline social security benefit assessments (Bench-Capon, 1991). Yet due to various failures from high ambitions (Leith, 2010) to non-scaleable hand coding, research and funding again stalled, and developers entered the “AI winter” of the late 1980s to mid 1990s.

The increased availability of processing power and use of the internet led to a small third wave at the end of the 1990s and early 2000s. However, progress in AI was dwarfed by other features of the information technology revolution, and particularly the growth of process-based automation across business and government.

The current and fourth wave has seen rapid adoption of AI technologies in new software applications advancing pattern recognition capabilities or software agency, that is, the ability of software to behave like real actors. This is being driven by third platform technologies that are AI friendly (such as Alphabet’s Tensor Processing Unit, Nvidia’s Volta GPU and IBM’s TrueNorth neuromorphic computing platform), extensive gains in computer processing power and speed, increased network interconnectivity, greater scalability, and massive proliferation of the digital data necessary to create the large data sets that make intelligent automation possible (IDC, 2018). The development by governments and corporations of innovation accelerator projects has also significantly assisted innovators and disruptors to achieve commerciality, saleability and a faster move to market.

The legal industry has not been immune from these trends. There is increasing market demand plus a push from large well-financed companies to leverage the potential of new technologies (iScoop n.d.). AI techniques such as text mining, knowledge based self-learning, machine learning and natural language processing (are coming into play as a means not just of enhancing accuracy and efficiency of existing services, but in creating new value-added services, such as automated legal prediction. They can analyse huge amounts of data with descriptive, diagnostic, predictive and prescriptive analytics tools (iScoop n.d.).
Recent advances see even more sophisticated AI technologies with even more complex machine learning and artificial intelligence including technologies such as neural networks, natural language generation and social intelligence solutions often layered together. Blockchain technologies add further dimension to automation, as they provide for transactions to be completed in a decentralised, distributed manner with no intermediaries or human involvement (Bacina, 2017).

Earlier innovations, like word processing, email and the internet have significantly transformed legal practice. It would be fundamentally unwise to assume that current technological innovations will have effects that are ultimately any less profound. At the same time, however, the hype (and fear) around automation is loud. Some champions of change argue that “AI and machine learning have reached a critical tipping point” and will increasingly augment and extend virtually every technology enabled service, thing or application” (Gartner, 2017). Yet as the hype cycle curve in Figure 2 indicates, while AI and machine learning are at the tip of the hype cycle, they are still at least some two to ten years away from significant adoption.

![Gartner Hype Cycle for Emerging Technologies](https://gartner.com/Smo\_therWithGartner)

*Figure 2: Gartner Hype Cycle for Emerging Technologies (Gartner, 2017)*
2.3 Current state of technologies

Legal researchers have highlighted areas of the law where AI technology will dramatically change what lawyers currently provide: discovery, legal search, document generation, advice generation, and prediction of case outcomes (McGinnis & Pearce, 2014). For this paper, a critical issue is that the cutting edge of fourth wave applications is fundamentally different from second wave expert systems and third wave automated process technology that used more causal, defined logic. A key difference is that the rules by which machine learning technology recommends decisions are not explicitly programmed by a human (Lodewyke, 2017), rather the machines “self-learn” from data using statistical reasoning. The machines are provided with gigabytes of data from selected databases and use algorithms to find concepts and patterns in the data, form and test hypotheses, and develop recommendations with analysis of that data.

The more intelligent systems can learn, adapt and potentially act autonomously rather than simply execute pre-defined instructions. The capacity for self-learning in turn enables these systems to build more complex, dynamic and adaptive models, and “improve” their performance over time on specific tasks (Surden, 2014). However, these machine systems do not “understand” their hypotheses in any sense of human understanding, nor do they reason about the causality in a strong or human-like way (Pearl, 2018). They also do not aim to mimic human intelligence. One vision of AI is to have systems that can learn the causal rules, using for example, inductive learning. However, such technology does not scale nor generalise as well as current statistically-based methods (T. Miller, 2018).

Will these new and accelerating technological advances see ALATs attain “superintelligence” in the near future? Superintelligence refers to intelligence greater than the smartest humans (Bostrum, 1997). Currently superintelligence is hypothetical. If superintelligence occurs, such machines would be able to create new machines more intelligent than themselves, ad infinitum (Bostrum, 2014). In other words, machines that “can learn and change future behaviour, leading to the creation of more intelligent devices and programs” (Gartner, 2017). While IT experts differ as to the speed with which AI will attain “superintelligence”, this is not likely to be in the next 5 or even 20 years. Predictions currently range between 25 to 80 years, with an average of 45 years (Etzioni, 2016). However, it is important to note that similar predications made in the past have not been fulfilled. In this paper our focus is limited to those technologies that are currently in or planned for production and available in the market for use by lawyers and the community.
3 Legal landscape

3.1 Australian legal industry

The Australian legal industry context is important as the industry is currently facing multiple external and internal pressures, accelerated by new technologies. The Australian legal profession is a diverse industry with a multitude of players carrying out a range of legal advisory work. The majority, 69% of 70,000 plus solicitors work in private practice, with 16% working in-house, 10% in government and 5% in other sectors such as community and legal assistance (Urbis, 2017).

While forming only 3% of Australian law firms, the large and increasingly international corporate law firms, along with the Big Four accounting firms and niche legal practices are likely to be a driving force in the development of ALATs, initially for routine and commoditisable work. This market segment has largely corporate, in-house and government clients seeking legal advice — much of which is likely to be relatively complex and specialised, and with relatively high profit margins. They are increasingly pressured by clients for greater efficiencies and reduced costs and have the resources to invest in technology to improve the value they provide.

Smaller firms with 1 to 4 partners representing 92% of lawyers in private practice. Of these, 73% are sole practitioners (Urbis, 2017). While this sector includes a growing number of boutique and ‘NewLaw’ entities that are adept at leveraging technology for corporate clients, this segment as a whole tends to have a client profile of smaller business and individual clients. These firms give legal advice that ranges from simple to complex yet more likely to be high volume and routine with lower profit margins. They tend to have less resources to invest in technology and may also see less pressure to change.

Community legal centres and legal aid services are a small sector with more limited resources and a diverse range of legal advice functions for their disadvantaged clients. This sector is seeing uptake in ALATs — especially those in niche and discrete areas of law to improve access and outcomes for clients.

There is also a potential market in the context of large-scale unmet legal need, as many individuals and SMEs experience legal problems, yet do not qualify for legal aid and cannot afford lawyers (Coumarelos et al., 2012). This “missing middle” constitutes a “latent market” should cheaper, quicker legal advice become available (Productivity Commission, 2014; Susskind & Susskind, 2015). Automation is, obviously, one way in which the access to justice gap may be narrowed. Automation may reduce existing cost barriers and make economic work that is not cost-effective to lawyers under existing service and pricing models. The reduction of geographical and time constraints in moving online also creates potential competition from differently or non-regulated overseas providers despite jurisdictional barriers to market entry. These providers may operate on larger scale than an individual law firm and have different cost models and margins allowing them to compete within the market. This is being seen as a potentially significant market, and possibly consumer, risk by the Australian legal profession (see, Law Society of NSW, 2017).

This overview shows how the market for legal advice and therefore for ALATs is significantly differentiated by law firm and client segments, and also the content and kind of legal advice sought.
3.2 Definition of legal advice

This project focuses on the work of legal advice and its automation. Advice-giving is a core lawyering function and at the heart of legal services regulation. The potential of technology to support the advice-giving function or even replicate and commoditise human advice-giving is central to the revival of interest of automation in law. Therefore, the question of what is involved in giving legal advice is important both conceptually and in regulatory terms.

Conceptually, it is generally agreed that legal advice concerns a legal problem or question specific to a client and “is taken as being tailored to the individual circumstances of the ‘client’” (Giddings & Robertson, 2001). Typical examples of legal advice include:

- Selecting, drafting, or completing legal forms, documents or agreements that affect a person’s legal rights;
- Representing a person before a court or other decision-making body;
- Negotiating legal rights or responsibilities on behalf of a person; and
- Predicting an outcome of a legal dispute.

Three questions arise from this definition with implications for system design, regulation, and the future development of the legal services market. First the question of (irreducible) complexity, second the separability of the legal component of advice, and third the more technical question of what distinguishes legal advice from ‘mere’ legal information.

Simplicity is relative. What is simple to an expert in the field will often seem difficult or complicated to a lay person. A distinction needs to be made between complicated and genuinely complex. Sometimes legal advice giving is straightforward, drawing on rules and principles that are relatively simple and clearly defined, such as whether or not a parking ticket was issued correctly, or whether you can legally change your name. Other times it may be more complicated such as whether or not a complex taxation ruling was issued correctly, or whether someone else can legally change your name. Simple, routine, advice-giving is can easily be automated, for example where rules are clearly expressed, readily applicable and reducible to simple decision trees.

There is, however, a genuine and possibly irreducible complexity to more bespoke legal advice giving. This requires the interplay of a broad range of knowledge, skills and professional attributes, such as capacity and skills in legal research, evidence gathering and weighting, legal analysis, the exercise of professional and ethical judgment, prediction as to the range of outcomes and assessment of those most likely, and the negotiation and representation of client interests. More expansively, it might also include elements of client counselling and relationship management, along with business decisions such as pricing/costing the service. This complexity sets a limit to what is replicable by technology. While technology is playing a growing role in assistance – particularly for research, analysis and prediction – it cannot presently replicate the whole package. Whether it will ever be able to do so is still moot.
Secondly, should the deep technical expertise associated with legal professional advice-giving become more readily replicable via machine technologies, this has major implications for the market. It potentially speeds up the blurring of boundaries between legal and other forms of commercial advice and consultancy. If technology can do the legal component as well or better than a human, what becomes of the legal function? What is distinctively legal? What will lawyers offer in the future that constitutes their unique selling position? And can the separation of law from other parts of business consulting still be justified?

Thirdly, the legal information/advice distinction matters both for system design and regulation. Legal information can be conceived of as a public good that should be readily and openly accessible. This principle sets some limits on both the regulation and commercialisation of pure legal information. Alternatively, legal advice has long been treated as a quasi-market good subject to significant protections and market closure. Legal technology has the potential to exploit and disrupt these boundaries and, at the least, create a set of new questions and challenges for regulation. This is a matter we discuss further in the next Section 3.3 and in Section 5.

### 3.3 Legal advice or legal information?

The concept of legal advice can be difficult to define and, specifically, to distinguish from the activity of providing legal information, which may be separate from, and also often a precursor to, as well as part of, giving legal advice. Commonly, “[l]egal information is described as generic, not addressing the particular circumstances of the individual. Legal advice is more tailored and specific to the needs of the consumer” (Giddings & Robertson, 2001). Examples that are not legal advice include:

- Legal information and self-help forms obtained from free online legal websites, including law firms, legal assistance and government departments;
- Advice from friends, family members, or previous clients of a lawyer;
- Information heard on the radio, read on social media websites or seen in newspapers; and
- Printed materials listed in a how to guide.

In theory there is a general distinction made between the giving of legal advice and the giving of legal information. However, in practice, there is not always a clear line between these.

The problem is apparent when we consider the development of technology-based and technology-enhanced document generation services, where there is a range of choices enabling a degree of customisation and selection. At what point does the technological assistance move from information to advice?

This distinction matters for regulation as discussed in the next section. For example, the information/advice distinction has been a key issue in the US, where new service providers like LegalZoom, Rocket Lawyer and Access Legal have developed new and sophisticated infomediary business models.
3.4 Regulation of legal advice

This section describes the ways in which legal advice is presently regulated. It also provides a background to Section 5 that explores how current regulatory arrangements impact automated legal advice.

The Australian legal profession is regulated in its practice by legislation, common law duties, and codes of conduct. The current regulation of legal advice operates through this interplay of general principles of law and specific professional regulation. In Australia, most of the regulations are set out in formal professional standards having the status of secondary legislation while some are supplemented by soft law guidance or norms from regulators or professional bodies. An example, showing how these interact, is the general duty to provide competent advice. If a solicitor does not act competently, they can be found guilty of both common law negligence, and of a breach of a fundamental professional obligation (Legal Profession Uniform Law Australian Solicitors Conduct Rules 2015, rule 4.1.3). However, competent advice is not defined in the professional rules leaving much of its scope and standard to be assessed by the common law.

Regulatory arrangements in Australia are complicated by the fact that the legal profession is organised on a State and Territory basis. New legislation, consistent with a Model Law was enacted in all Australian jurisdictions between 2004 and 2008, except South Australia. Since July 2015, the legal professions in Victoria and New South Wales have been governed by a fundamentally common regime under the Legal Profession Uniform Law (the Uniform Law). Despite this, regulations still vary. Although it is likely that outcomes with concerning the legal advice and information distinction would be substantially similar across Australia. (A comparative survey is in Beames, 2017, p298-9).

These laws and regulations govern three main features of legal advice relevant for ALATs:

- The intrinsic quality of legal advice;
- The process of advice-giving; and
- The capacity to deliver legal advice.
3.5 Regulation of quality and ethics

Quality controls include lawyers’ duties to the court and to clients, such as to avoid professional negligence, to provide standards of service consistent with the Australian Consumer Law, and professional duties to be competent. Lawyers also have duties to maintain high ethical and professional conduct standards. These may also be seen as an intrinsic part of the quality of professional legal advice.

3.6 Regulation of process

There is a less well-established and less extensive system of process regulation. While there are no legal rules directly governing the process of how to give legal advice to a client, there are regulations that indirectly impact that process. For example, process rules around information standards for cost disclosure require a description of the kind of legal work being carried out (Legal Profession Uniform Law Division 3). This also includes description of the scope of retainer and disclosure of certain risk information such as conflicts of interest or commissions. Other forms of process control exist in general legislation, including, for example, privacy and data protection requirements and consumer law.

3.7 Regulation of capacity

As legal advice-giving is a controlled activity, the category of capacity rules covers what is legal advice and legal practice, and who can lawfully give legal advice. The nature and extent of capacity regulation has significant consequences for market segmentation and access to justice. By defining who can give legal advice, it sets direct controls on supply-side access to the market for legal services. While such controls have consumer protection justifications, in the context of access to justice, policy questions are being raised as to where and how to draw capacity lines. It is recognised that both regulation and technology can be used as disruptive tools, which have the potential to separate access to justice from access to lawyers.

In this section we look at the way common law systems in general, and Australian systems in particular, regulate capacity, and therefore access, and address its consequences for the technological disruption of the legal services market. Most common law systems seek to regulate the supply of legal services, in one of two ways. Australia, Canada and the US treat the supply of legal services broadly as an activity reserved to certain professional titles, such as a solicitor or barrister. In contrast, England and Wales treat the supply of legal services by reserving specific types of legal work to those with a professional title.
In England and Wales, legal services regulation focuses on six broadly reserved activities. These are the exercise of a right of audience, the preparation and conduct of litigation, preparation of a contract for the sale or transfer of land, probate and notarial activities, and the administration of oaths (Legal Services Act 2007, s.12). Solicitors and barristers in England are regulated for all their work. This includes those reserved activities listed above but also much business and employment work, and large areas of consumer and social welfare law. As a result, there is a growing unregulated market for unresolved legal services. These services may be provided by non-lawyers, or by lawyers without practising certificates, for example in human resource departments, debt recovery businesses, or as self-employed professional litigation assistants and lay advisers (Legal Services Board (E&W), 2016).

In the US and Canada, the legal services markets are less liberalised with ‘legal advice’ used as a term of art to distinguish core activities reserved to the regulated legal profession. It is illegal to provide legal advice other than as a licensed lawyer since this constitutes the unauthorised or unqualified practice of law (known as UPL). The history of UPL controls reveals mixed motivations ranging from the private interests of bar associations restricting competition from non-lawyers (Denckla, 1999) to the public interest and consumer protection arguments for access to justice and assuring quality of legal advice-giving.

As noted above, in the US, new service providers like LegalZoom, Rocket Lawyer and Access Legal have developed sophisticated infomediary business models (see Appendix A). The US has seen legal industry stakeholders challenge such ALATs, alleging they are engaging in “unauthorised practice of law” often using the information/advice distinction to challenge such disruptors (Campbell, 2012; Brescia, McCarthy, McDonald, Potts & Rivais, 2015). For example, LegalZoom has had cases filed against it from California to North Carolina asserting that LegalZoom’s process goes beyond providing legal documents and enters the role of legal adviser. These challenges had early success in some states but have also seen some failures. Overall, the reasoning and outcomes in the courts have varied widely. Reversing the trend, LegalZoom filed a US$10.5m antitrust suit against the North Carolina State Bar for denying it permission to sell legal services in June 2015 (IBA, 2016). The case ultimately settled with a consent agreement which permitted the company to continue operating in that jurisdiction. Notwithstanding the various challenges, LegalZoom continues to operate “filling what is seen as a previously unmet gap in the [US] legal services market and serving to date over three million customers” (Beames, 2017, p298), and expanding its operations overseas.

Does this mean that going forward the new disruptors have a green light? Not necessarily. The US litigation on UPL focuses on the nature of the technology. For example, one US State court found there was no UPL because the software did not ultimately deliver advice (Medlock v LegalZoom, 2013), finding that:

LegalZoom’s software acts at the specific instruction of the customer and records the customer’s original information verbatim, exactly as it is provided by the customer. The software does not exercise any judgment or discretion but operates automatically in the same fashion as a ‘mail merge’ program” (Ambrogi, 2014).

However potentially, as software becomes more sophisticated and intelligent, the advice/information distinction may surface again.
The information/advice distinction operates somewhat obliquely within Australian legal services regulation. This reflects the historical tendency of legislation to define the scope of regulated legal services as equivalent to “engaging in legal practice”, while leaving the meaning and scope of legal practice itself undefined (Bartlett & Burrell, 2013). This tendency is continued in the new Uniform Law. The Legal Profession Uniform Law prohibits “unqualified entities” from engaging in legal practice (Section 10). It then defines “legal practice” non-exhaustively and in a manner that appears somewhat circular (see also Beames, 2017, p.298). To “engage in legal practice” includes to “practise law or provide legal services but does not include engage in policy work (which, without limitation, includes developing and commenting on legal policy)” (Legal Profession Uniform Law, s6). In turn, legal services are defined as “work done, or business transacted, in the ordinary course of legal practice” (Legal Profession Uniform Law, s6 note).

The Uniform Law’s emphasis on work done in the “ordinary course” of practice echoes earlier tests adopted by the courts in determining UPL, which made material the distinction between information and advice. The widely approved starting point is Justice Phillips decision in Cornall v Nagle [1995] 2 VR 188. Section 90 of the then Legal Profession Practice Act 1958 (Vic) prohibited any unqualified person from “acting or practising as a solicitor”. His Honour identified giving legal advice per se (at least for reward) as lying “at or near the very centre of the practice of law.” The control over legal advice was justified in classic public interest terms; it involves “doing something which, in order that the public may be adequately protected, is required to be done only by those who have the necessary training and expertise in the law” (Cornall v Nagle (1995) p.20).

Later cases have shown that any tailoring of legal information to specific circumstances and to “ensure a specific result” is likely to involve legal advice and therefore be seen as (regulated) legal practice (Barristers’ Board v Palm Management Pty Ltd [1984] WAR 101; followed in Attorney-General v Quill Wills Ltd [1990] WASC 604, Legal Practice Board v Giraudo [2010] WASC 4, and Legal Services Commissioner v Walter [2011] QSC 132). This also has the effect of leaving informational legal work that is merely clerical (outside the reach of regulation (Attorney-General v Quill Wills Ltd [1990] WASC 604).

Australian academics and professional bodies are recognising the regulatory significance and effect of UPL rules in the context of new technologies. Recently two professional bodies indicated some unease at the current scope of regulation. The Law Society of NSW’s FLIP Inquiry (2017) explored the role of new information providers and concluded by recommending that “the Law Society investigate bringing legal information within the regulatory fold” (Recommendation 16). In contrast the Law Society of Western Australia (2017) has recently called for the creation of a regulated market in ALATs stating “An entity that is not a qualified entity may not in this jurisdiction give to another entity a product or thing that provides, or is capable of providing, legal services unless the second entity is a qualified entity” (p.12).

In conclusion, the Australian jurisprudence aligns more closely with the US and Canadian approaches yet retains some of its own features and complexities. There is also the risk of inconsistency across state and territory jurisdictions. Therefore, continuing conversation is required about how regulation should evolve.
3.8 Adoption of technology by lawyers

Richard Susskind’s book *The End of Lawyers?* suggested a future where lawyers adapted to new technologies or were gradually replaced by increasingly capable machines (Susskind, 2010). While adoption of technologies has been slower in law than in other service industries (Wallace, 2017), this is changing. Technology is now core to the practice of law for most lawyers with widespread use of email, online legal research and electronic court filing. Process-oriented technologies are gradually increasing with online legal information, simple document assembly, e-discovery, workflow and project management. New technologies are adding front-end client-facing services and business development (J. Goodman, 2016). Lawyers increasingly seek to use technologies to give or assist them in giving legal advice, acknowledging the benefits of productivity gains and cost savings.

The literature is increasingly predicting the rise of artificial intelligence for lawyers and legal work (for example Beaton, 2014; K. Miller, 2015; Law Society of NSW, 2017; Susskind & Susskind, 2015). Some authors predict the rise of robot lawyers (Koebler, 2017) and technological unemployment (Mangan, 2017). Our review has found that this is not yet the case with ALATs and legal advice. Other authors are more restrained seeing that AI can “make life easier for lawyers” (Lodewyke, 2017) and can “remove lawyers from routine tasks that computers can handle, allowing lawyers to focus on tasks that truly add value, and things that computers really cannot do or do well” (S. Miller, 2017a).

The new and emerging ALATs that are the focus of this project are sometimes simple. Yet they are becoming increasingly smart, smarter and intelligent. They are built on artificial intelligence, natural language processing, and machine learning tailored for legal services. They have access to vastly increasing amounts of digitised data such as court cases, legal documents and pleadings, legal journals and research, legal websites, and a range of legal subject matters.

The next section explores the current state of ALATs and the key trends in the automated giving of legal advice.
4 Review of Examples of ALATs

This paper has collated and reviewed a selection of examples of current state of ALATs as at February 2018 from the UK, US and Australia. The selection includes new business models that arise from the use of these ALAT technologies. These are set out in Appendix A. This section examines the trends and findings arising from the development, use and uptake of ALATs.

4.1 Classification difficulties

Classifying ALATs is difficult. There are multiple dimensions to legal advice and to ALAT technologies for even very task-specific AI. From this, a key finding is that there is no necessary correlation between the complexity of the underlying technologies and the complexity of legal advice. Both ALAT technologies and legal advice have far more dimensions. This paper is a starting point.

4.2 Classification by legal advice functions

Our primary classification of ALATs is by their function in relation to legal advice giving. As seen in Appendix A, these are:

- Specialised standalone technologies, such as legal chatbots, apps and virtual assistants;
- Enablers of legal advice such as legal automated drafting, legal document review and legal algorithms;
- Further enablers of legal advice such as legal data analytics and predictors, and legal artificial intelligence;
- Automation of legal advice with truly smart contracts; and
- Sets of ALAT technologies enabling NewLaw business models and legal technology companies.
4.3 Classification by technology

This project aims to engage with the technical capabilities of ALATs and so understand how legal advice may or may not align with existing technologies.

With the ALATs, there are scales of “smart” in the underlying technologies. Some ALATs are simple, being non-AI tools relying solely on hard-coded decisions. More ALATs integrate some concepts of AI, with most being “smart”, using simple pre-programmed causal rules and automated reasoning to make decisions. Smarter ALATs add machine learning where a computer can make decisions with minimal programming, that is, rather than following pre-set rules about how to interpret a set of data, the computer uses learning algorithms for solving particular problems that allow it to determine the rules itself. Deep learning uses more advanced algorithms to perform more abstract tasks. With experience, data, and feedback, computers become better at the relevant tasks. “Smarter” to “more intelligent” sophisticated technologies can parse text, learn causations and correlations from data, and reason about these to make predictions.

The examples of ALATs contained in Appendix A are primarily classified by their functions in relation to the giving of legal advice. For many of the ALATs, it is not always possible to know the technology underlying them and additionally these may be private or commercial-in-confidence. We have made educated guesses and will aim to improve these in later stages of the research.

While we recognise that there are multiple dimensions, this project uses the dimensions and rating scale for ALATs in Appendix A set out in Figure 3 below. This scale ranges from simple to intelligent with the intermediate steps of smart and smarter (T Miller, 2017).

<table>
<thead>
<tr>
<th>Rating</th>
<th>Simple</th>
<th>Smart</th>
<th>Smarter</th>
<th>Intelligent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Symbol</td>
<td>🐳</td>
<td>🐳狮子</td>
<td>🐳 白狮</td>
<td>🐳 大白狮</td>
</tr>
</tbody>
</table>

*Figure 3: ALAT Rating System*

We seek to explore the technical state of automated legal technology using a broad umbrella perspective of artificial intelligence. As a basic model, we place each technology into one of four categories based on the ‘level’ of intelligence. These categories are derived from two dimensions, each with two values:

- The first dimension is whether the knowledge in the underlying tool model has been hand-coded based on human expertise or has been learnt via data, that is, machine learning, and

- The second dimension is whether the underlying model consists of causal information or merely correlations. As noted by Pearl (2018), statistical, or ‘model-free’ learning techniques answer questions about associations between variables, but their lack of causal models means they cannot answer questions about interventions (‘What if we did X?’) or counterfactuals (‘Why did X happen?’).
Figure 4 shows the four quadrants from these two dimensions and how they map to the rating system.

<table>
<thead>
<tr>
<th></th>
<th>Statistical Reasoning</th>
<th>Causal Reasoning</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hand-coded Knowledge</strong></td>
<td>Reasoning is by association only, and knowledge is limited to what the human can encode</td>
<td>Reasoning is reasonably sophisticated in that the intelligence reasons about cause and effect between variables to derive outcomes and can answer questions about interventions and counterfactuals.</td>
</tr>
<tr>
<td>Hand-coded by people</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Data-learnt Knowledge</strong></td>
<td>Reasoning is by association only; predictions are based on patterns found in data. May extract relationships seen by human encoder</td>
<td>Combines the power of causal reasoning with ability to learn from data</td>
</tr>
<tr>
<td>Learnt from data</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Figure 4: ALAT Rating System Categories*

Hand-coded models can often appear more sophisticated than learnt models, but deriving and maintaining hand-coded models is time-consuming and expensive. Such models may miss relationships that a machine learning algorithm could extract but are not clear to a human. The ultimate is to have learnt, causal models; the weakest is hand-coded correlative models. The other two are in-between and not really comparable on an intelligence scale per se, as their sophistication depends mostly on the underlying data or hand-coding respectively. However, in the current environment, machine learning has certainly been used much more successfully in many domains, including law. As such it is placed higher on the scale than hand-coded causal approaches.

While some technologies (and some artificial intelligence techniques) can be categorised into more than one quadrant, we believe that this simple model is suitable for the purposes of ALATs. Typically, most artificial intelligence techniques and the technologies built on them fall into either the top-right or bottom-left quadrant. Models describing associations are not as powerful as those describing causation, so most techniques that rely on hand-coded models explicitly encode causal relationships, meaning that technologies in the top-left are rare. It is difficult to extract true causal relationships from data alone, meaning that the bottom-right quadrant is also rare. Techniques to learn causal modelling exist (Pearl, 2018), but research in this area is in its infancy compared to statistical machine learning. One could categorise recent techniques such as deep reinforcement learning into this category as at a basic level, they have been used to capture relationships between actions in applications such as in Alpha Go (Silver at al 2017), although they are far from the sophistication found in many other causal-based techniques.
4.4 Diversity

Our review has found a range and diversity of ALATs. This diversity offers opportunities for different and even changed ways of providing “legal advice”. ALATs are at different stages of capability to provide legal advice, from giving legal advice on their own, to being supervised or reviewed by a lawyer, to assisting and augmenting legal advice, or unbundling legal advice into smaller discrete tasks again.

The review also found that ALATs are still new, with the majority dating from 2015 to 2017. Most are found in the US rather than the UK and Australia, perhaps due to a greater amount of venture capital (Furlong, 2014) and a large number of ALATs are start-ups.

There is an active debate as to the type and amount of legal work that can be automated. It is argued that different kinds of legal work are more or less “amenable” to automation with predictions ranging from 40% to under 10% (compare for example, Deloitte, 2016; NSW Law Society, 2017; Susskind & Susskind, 2015).

When examining the task of legal advice and its multiple dimensions, different types of automation may be able to carry out some or many subtasks. Routine aspects of the task are most likely to see automation. With rapid technological developments more complex tasks in legal services are also being automated. Often the path of simplicity to complexity is assumed – as it correlates with the level of complexity of technology. However, as discussed above and shown in table 4 automation based upon a number of factors. Amenability to automation will turn on a variety of factors, including the specific area of law, legal subject matter and context particularly as to ambiguity, conflicting rights, open-endedness and unique facts (Pasquale & Cashwell, 2015). The next sections of this chapter examine the categories of ALATs in greater detail.
4.5 Specialised standalone technologies

One set of technologies tend to be specialised standalone technologies that offer legal advisory outcomes to both consumers and to lawyers. Chatbots, or legal bots, are mobile or web-based services powered by rules using conditional and casual decision logic trees and sometimes more sophisticated AI techniques. From 2015 early commercial and free chatbots provided legal support and advice, particularly facilitating access to justice. Now dozens of chatbots deliver legal services mainly on a single legal issue, both for consumers and small businesses, some to assist lawyers (Ambrogi, 2017; Coade, 2016).

Legal apps or applications carry out analysis and apply legal logic, meaning that they have the capacity to (often) give legal advice. While often very specific to an area of law or legal practice, is there a need for a lawyer where such an app exists? An early adopter of legal apps was the legal aid and legal assistance sector as a means of extending resources (K. Miller, 2015). Legal apps are also used by commercial lawyers, for example, one corporate legal team “is using around 30 bespoke legal apps supporting a wide variety of work, including mergers and acquisitions, contract negotiation, litigation, e-billing, and digital signatures” (Walker quoted in Law Society of New South Wales, 2017). Others are more focused on broadening access to the law by assisting lawyers and also creating self-help tools to deliver services directly to users. As introduced by Georgetown University Law Center, some Australian law schools are now running electives such as Law Apps courses and #hackathons (for example, Melbourne, Deakin, UNSW, UTS and QUT).

Virtual Assistants are an additional class of chat bots. These extend chat bots to work within law firms. The virtual assistants provide information and advice to lawyers helping to make internal processes more efficient and manageable.

4.6 Enablers of legal advice

ALATs are also enablers of legal advice when assisting lawyers to do their work better with intelligent automation, as well as when targeted directly to clients. The current iteration of legal automated drafting ALATs sees largely automated tailoring through checklists and self-help guides. Currently many smaller offerings are limited to niche areas of law (Gardner, 2017) including a range of will drafting options (K Miller, 2017). Other tools targeting larger law firms tend to be broader, assisting lawyers to advise on and draft a range of simple to complex documents.

Similarly, ALATs assist lawyers to review and advise on documents. ALATs may read, review and analyse contracts as to the risks and obligations and highlight legal issues to consider. More advanced versions use AI and machine learning to learn from new contracts processed, such as identifying missing clauses or clauses that are unusual. One ALAT example that reviews contracts has a disclaimer that states it does not give legal advice.

Underlying many ALATs are algorithms or mathematical instructions that are both explicitly programmed to calculate outcomes or, when more advanced, are designed to allow computers to learn on their own and so create their own algorithms. These algorithms are also used to assist with sentencing or bail decisions in court or to allocate assets in family law.
A key issue is whether or not the algorithms are transparent and explainable. For example, as a commercial service widely used in the US to assist with bail determinations, Compass Core’s Northpointe does not make its algorithms public. Research has questioned the equity of the outcomes when using such algorithms. Some research has shown that software helping judges decide on bail can cut crime and reduce racial disparities when tested on over 100,000 cases (Simonite, 2017). In contrast ProPublica’s study of 7000 offenders found that Compas Core appeared to have a strong bias against black defendants (Angwin, Larson, Mattu, & Kirchner, 2016).

### 4.7 Further enablers of legal advice

Two more sets of ALATs provide data legal analytics and predictive analytics. These tend to use technologies that are in our terms smarter and more intelligent. Legal analytics ALATs use advanced technologies such as machine learning and natural language processing to mine the volumes of data in the litigation ecosystem. Legal analytics reveal trends and patterns in past litigation that inform legal strategy and anticipate and predict outcomes in current cases, offering data-based answers to key questions such as: What are our odds of winning? What are the preferences of Judge X? What tactics have defence lawyers used in similar cases?

One significant form of ALAT uses advanced legal artificial intelligence technologies to facilitate legal research functions. Lawyers develop advice by carrying out legal research, finding the relevant law to apply to facts of a specific problem using legal reasoning. A leading example is the work of Ross Intelligence, built on IBM’s Watson platform. It enables users to ask questions in natural language and will analyse the question. The system will undertake legal research by mining the body of law – legislation, cases and secondary materials to provide specific answers. The result takes on average a few seconds to produce research that might take human lawyers several hours (Rinaldi, 2017). Ailira, an Australian legal artificial intelligence also uses natural language processing and scaled machine learning to provide automated research assistance. Focussed initially on taxation law, Ailira is expanding into other areas of work to develop what its founder, Adrian Cartland describes as “the law firm without lawyers” (Bindman, 2017).
4.8 Human-free smart contracts

Another aspect of ALATs is via the use of smart contracts to automatically form and execute contractual relationships. Smart contracts are automated computer programs that self-execute based upon a specific input. These contracts are contained in a decentralised distributed ledger known as the blockchain (Jehl, 2018).

Trust is the key problem that blockchain technology addresses (Würst & Gervais, 2017). This is reflected in the distributed nature of the technology enabling the exchange of information in trustless environments. Transactions are stored in blocks that comprise an encrypted ledger of some transactions. Blocks are produced by computers that facilitate the transactions by performing advanced cryptographic calculations. The blocks are collated together into chains, hence the term blockchain. Once a transaction is deemed valid based on the consensus model the block is written to the blockchain. The blockchain is then updated across all nodes with the new block. This provides a record of all the transactions. Changing the blockchain is difficult as it requires the involvement of the majority nodes. Therefore, should an individual seek to re-write the transaction it will not align with cryptographic signature of chain and therefore will be invalid (Würst & Gervais, 2017). There is not one canonical blockchain. Instances of blockchains can be established between nodes of computers and as a ledger can store information for a diverse range of use cases such across finance, Internet of Things, document management, and insurance. (Crosby, Nachiappan, Verma, & Kalyanaraman, 2016).

Smart contracts are computer programs that build upon the blockchain. One such technology is Ethereum, which allows for the creation of applications using a complete programming language, solidity, that are then distributed across the blockchain (Buterin, 2018). Applications are built on top of this foundation to manage and control in a decentralised manner. Smart contracts they have more in common with computer programs than contemporary legal contracts. They allow the execution of specified code in response to an input. A basic example is assessment of the purported status of goods that have been transfer. If they meet the desired quality, the transaction completes automatically.

Smart contracts are not an advice-giving technology as such, however, as they become widespread, they may enact “a fundamental shift in the role of legal advice” (Bacina, 2017). For example, lawyers may need to pay additional attention to the establishment of contracts that are to be encoded upon a blockchain, as given their immutable nature deviation once created they are extremely difficult to undo. This is likely to create new risks and responsibilities intrinsic to smart contracts, which involve different considerations and advice, from the more conventional contracting process.
Two key elements of smart contracts are relevant to legal regulation. First, following the establishment of the agreement there is no human involvement – lawyer or client – in performance. Instead, the automated code is designed to execute based on specific predetermined parameters. This is done without reference to the contracting parties’ later intentions or desires. Second, decentralised blockchains remove or reduce the need for a trusted third party (Bacina, 2017). This raises issues relating to liability relating incorrect inputs triggering a contract action, errors and mistakes. Smart contracts are proposed for a number of industries, with many focusing on supply chain management. In Australia, agtech company, AgriDigital is piloting of the world’s first wheat sale using a smart contract on a blockchain ledger.

## 4.9 Sets of ALAT technologies

ALATs are emerging against a backdrop of broader technological disruption in the legal market. There are now mash-ups of sets of ALAT technologies enabling NewLaw business models such as Legal Zoom and Rocket Lawyer who use automation technology for high-volume work. Since 2017 Legal Zoom has been using more intelligent AI for marketing in a partnership with Veritome One. At the corporate law end of the market, Riverview Law has partnered with Liverpool University AI’s expertise. In Australia, developments seem slower and less advanced.

A number of ALATs are developed by technology companies that work in the legal services market. Some provide technology platforms providing multiple tools, others are more specialised. As seen in examples in Appendix A, many of these technology companies are key players and partners in developing smart apps and other ALATs that “encapsulate legal knowledge, reasoning and judgement to provide self-service real time legal advice” (J. Goodman, 2016).
5 Regulatory issues emerging from use of ALATs

5.1 The impact of ALATs on regulation

With its focus on the current state of ALATs, this paper can only begin to raise some of the regulatory issues that emerge from using ALATs for legal advice. Thus, it does not explore more general legal questions of privacy, confidentiality or cybersecurity. These will be considered later in this project.

As can be seen in the examples in Appendix A, the current state of ALATs may create multiple challenges for regulators of legal advice: reframing or extending paradigms, and even creating new ones. It seems that technology is racing ahead and has the potential or capability to give automated legal advice at least in simple specialised areas of law and, for more complex cases, at least for some of the tasks involved. Yet legal professional regulation does not seem to be keeping pace. What consideration around regulatory risks and barriers to access to justice and the impact of the use of ALATs has been carried out specifically for the legal industry?

While it has been recognised that “artificial intelligence raises regulatory and ethical issues that require investigation and guidance for solicitors” (Law Society of NSW, 2017 p4), there seems to have been limited exploration of such issues.

This paper finds that technological innovation may both extend known regulatory issues, and also create new regulatory concerns. Together these raise issues for oversight of ALATs, that is, for the role of regulators.

5.2 Legal advice: just by lawyers?

A fundamental and controversial question is the role of lawyers in giving legal advice. Are lawyers enablers of access to the law or seekers of monopoly rents? Is the current regulatory monopoly of lawyers over legal advice justified in this technology-driven world? Underlying these crucial questions are a number of others.

Regulatory restrictions as to who can provide legal advice creates fuzzy distinctions between “legal advice” and “legal information”. Various ALATs claim they only provide generic legal information such as draft letters of advice (for example the DoNotPay chatbot) or have disclaimers that free legal documents are not legal advice. Should legal industry stakeholders be able to challenge ALATs for engaging in “unauthorised practice of law”?

The difference between advice and information is not merely technical, it is also important for public and regulatory policy. The law, particularly case law, statutes and regulations, is a matter of public record, and access to such legal information can be defined as a public good in its own right. While public interest arguments can be raised against unqualified practice of law (UPL) controls, it is also not in the public interest that access to public legal information be circumscribed in support of professional monopoly privileges. These arguments may of course apply with less force where such information is to be embedded
in commercial rather than free systems.

The Australian regime is susceptible to many of the criticisms directed at its US counterparts (see eg, Denckla, 1999; Rhode and Ricca, 2014). For example, it could be said to have adopted and maintained a paternalistic approach to consumer choice, a reliance on broad prescriptions that are potentially anti-competitive in effect and, perhaps, a failure to engage with the question of what regulation in the public interest requires in a climate of declining access to law.

Should there be a withdrawing or perhaps an extension of UPL regulation, or should “the key focus” shift from “blocking these innovations from the market, [to] using regulation to ensure that the public’s interests are met” (Rhode and Ricca, 2014 pp 2607-8)? That in turn is a question for the empirical research that will follow and flow out of this paper.

A recent report (IBA, 2016) has suggested that the evolution of legal services from bespoke to commoditised and standardised or packaged services with the aid of ALATs “are likely to yield significant benefits for consumers in terms of cost, quality and access to justice” (IBA, 2016, p5). This may require lawyers to “overcome the conservative, risk-adverse culture that seems to pervade the profession and may need to deconstruct their structure and pricing models” (IBA, 2016, p5).

5.3 Quality of legal advice?

One regulatory issue raised is around the quality of legal advice provided by ALATs. Whether the legal advice is of the same quality is often debated. Some argue that technology carries out certain tasks better than humans, particularly searching for patterns in large volumes of data (Nissan, 2017) and predictive analysis. One recent study recorded legal experts as providing 66% accuracy compared to 70% for the computer (Katz, Bommarito II, & Blackman, 2017). Some see access to “good enough” law as desirable when faced with a choice between nothing and an unaffordable service (Susskind & Susskind, 2015). Others see the risks to consumers as too significant (Law Society of NSW, 2017). How best do we balance the competing interests involved?
5.4 Substantive law?

Technological issues can also arise around ensuring the substantive law applied by the ALAT is accurate. Who is translating the law into code that decides the output of advice? Are they legally trained? Who assesses how often complex and labyrinthine law is accurately translated into code? (Hogan-Doran, 2017). Who ensures the law contained within the ALAT incorporates the latest legal developments and is up-to-date? Who decides and how is it decided as to the relevant context, content or weighting of different factors? If framing decisions are made at the time of coding, how is the discretion exercised at the time of giving the advice? (McCalman, 2017). And:

[A]lgorithms can make systems smarter, but without adding a little common sense into the equation they can still produce some pretty bizarre results (DeAngelis, 2014).

More difficult and philosophical questions arise around advice on meaning when there is ambiguity and uncertainty in the law. Dworkin used the metaphor of the imaginary ideal judge Hercules.

To resolve hard cases, Hercules invoked his entire ethical being, his knowledge of the principles underpinning legal institutions in a democracy, his familiarity with legal policy, a sense of the need for coherent doctrine and finally, his knowledge of the specific statute and case law, to approach matters for which there was no precedent. How do we code for Hercules? (Law Society of NSW, 2017, p41).

5.5 Duty to be competent?

There is a distinction between being comfortable with technology, or a digital native, and being conversant with how technology is used in legal advice. What does the duty to deliver legal advice competently now require? For example, does a lawyer who provides a legal service supported by an ALAT need to understand how that technology works, or who uses an artificially intelligent algorithm need to understand the workings of the algorithm and the integrity of the data used (Law Society of NSW, 2017)?

The US profession has recommended extending the duty of competence incorporate some degree of technological competence. In 2012, the American Bar Association changed the Model Rules of Professional Conduct to recommend that a lawyer’s duty of competence include staying up-to-date with changes in relevant technologies. At least 25 states have adopted that change with many also mandating technology-specific learning in continuing professional development (Law Society of NSW, 2017, p41). Are we moving to a point where, as the reliability of technologically-assisted outcomes starts to supersede human levels of accuracy mean that failure to use technology will itself become a failure of lawyer competency?
5.6 Wider professional duties?
As the examples in Appendix A show, using ALATs for assisting and giving legal advice are powerful tools. ALATs potentially enable citizens to access quicker and cheaper legal advice, and so increase access to the law, including access for the middle market discussed above. They can also free up lawyers from routine and basic transactional tasks, giving lawyers more time to think through problems and advise clients. This points to potential increases in the quality of advice, and the efficiency with which it is delivered. These potentialities, of themselves, have larger ethical implications. If technology reduces costs, could or should the normalisation of its use shape assessments of what is fair and reasonable charging? Longer term, should lawyers have any ethical obligation to use ALATs if this would significantly reduce the cost and increase efficiency and accessibility of legal service delivery?

5.7 The Black Box problem: transparency versus explanation of legal reasoning?
A new regulatory issue for legal advice is created by the “black box problem”. This refers to the fact that legal decisions, or support for them, may be provided by an algorithm that does not provide any reason or explanation for this decision. The ability to give reasons is critical to sophisticated advice-giving by human lawyers. Decisions made by opaque algorithms is “analogous to evidence offered by an anonymous expert, whom one cannot cross-examine” (Brooks, 2017, quoting Pasquale).

The issue is that extracting and presenting reasons for AI-based decisions is a challenging task. Where logic is causal and structural, such as with process automation, this can allow lawyers and clients to see the reasoning and assess how the technology delivered the legal advice. However, an explanation is not as simple as extracting a chain of causal reasoning; it needs to be presented to a person (Miller, Howe, & Sonenberg, 2017), answer the specific question that the person has, and select the most pertinent causes (Miller, 2018).

However, the problem becomes even more difficult with many machine learning techniques. First, most of these techniques learn associations using statistical methods, while people present and evaluate explanations using causality (Miller, 2018). Second, many of these techniques, such as neural networks, learn models that are difficult even for experts to understand. Making these models transparent to non-expert users would be a pointless exercise. Instead that they would require post-hoc explanation that justifies decisions based on input parameters.

With smarter and more intelligent automation where machines are increasingly learning using big legal data, and dynamically so, this is more complex, leaving big questions: How can we trace legal reasoning logic? What legal data has been considered, seen as relevant, and how was it sourced? How did learning occur and were there any biases? And further, deeper questions arise. What values lie within the logic? What conscious or unconscious assumptions have been made that are not explicated? Why has the data chosen been so chosen?
This becomes more complex where the ALAT is a commercial service and the owners seek to protect their intellectual property by keeping the logic and data confidential.

This issue was raised in 2016 in the US:

**Problem:** AI and automated decision-making systems are often deployed as a background process, unknown and unseen by those they impact. Even when they are seen, they may provide assessments and guide decisions without being fully understood or evaluated. Visible or not, as AI systems proliferate through social domains there are few established means to validate AI systems’ fairness, and to contest or rectify wrong or harmful decisions or impacts.

**Recommendation:** Support research to develop the means of measuring and assessing AI systems’ accuracy and fairness during the design and development stage (Crawford & Whittaker, 2016).

This is considered such an important problem that in 2016, the European Union introduced the General Data Protection Regulation (GDPR). This has been described by many as mandating the “right to explanation” for any decision made about an individual where the decision can “significantly affect users” (Goodman & Flaxman, 2016). A recent article has questioned this arguing “the GDPR lacks precise language as well as explicit and well-defined rights and safeguards against automated decision-making, and therefore runs the risk of being toothless” (Wachtler, Mittelstadt & Floridi 2017, p 76). In order for such a right to be useful it needs to be legally binding, either through amendment of the GDPR or through nation states acting to provide additional protections (Wachtler, et al., 2017). A central question facing ALATs is do we need to create explainability standards and, if so, what should these look like?

5.8 **Timing?**

While the hype is loud as to the future potential of AI technologies, there are real concerns as to the scope and scale of regulatory, ethical, and security issues that can, and should, be addressed now. For example, it is foreseeable that as technology becomes increasingly ubiquitous throughout the market for legal services, the question how digital divides within the legal industry can be managed will become more pressing.

There are also issues relating to values and ethics designed into the ALATs. These concern matters such as:

- The values encoded into the logic;
- Larger assumptions regarding what constitutes ‘appropriate’ professional services (such as whether advice should routinely go beyond technical accuracy and account for competing interests and values of clients and other interested parties); and
- Whether low levels of explainability could actually lead to a diminished and highly instrumentalised understanding and valuation of law itself.
If these debates are not had soon, the solutions are more likely to be both ad hoc and hard-wired into the technology. Is the first obligation of designers and adopters to “Let these debates and the rich diversity of human values remain human” (De Clerck & De Wit, 2017; Tucker, 2016)?

5.9 The scope and role of regulation?

A further question is who should carry out the regulation and for what purpose? Currently in Australia, legal services regulation is fragmented and sub-divided between the professional regulation of lawyers and bodies of general law and regulation that aim to protect consumers, such as consumer protection law, tort liability, data use and privacy. Already there are, inevitably, overlaps and discontinuities between and within such protection and redress systems. Whether, and if so how, regulatory responsibilities and access to consumer redress could be streamlined is a much larger question than that explored in this project. However, it is likely that increased professional engagement with technology will create new boundary questions for regulation.

These all point to legal services regulators as having a role and responsibility for the oversight of technology and ALATs. More specifically, ALATs create at least three significant problems for legal services regulators:

**Consistency:** Currently different supervisory regimes exist for supervising automated legal information outside the legal industry. and for automated legal information and advice within the regulated legal industry. Is this variance appropriate?

**Reach:** There are many questions about the reach of regulation. For example, should there be oversight of the technology, or is it adequate to assess only the quality of service outcomes, however achieved? Also, how should or could regulation overcome the problem that online services may be delivered from outside the regulator’s physical jurisdiction?

**Purpose:** In the context of a relatively profession-centric, as opposed to more widely market-based, model of legal services regulation in Australia, the disruptive potential of ALAT technology raises a fundamental challenge whether the primary function of regulation is to enable access to lawyers, or access to the law? (Webb et al., 2017). It has been suggested that professional regulation is perceived by some as primarily protecting lawyers’ monopoly (Law Society of NSW 2017).

Since regulators in Australia are required to “ensure efficient, effective, targeted and proportionate regulation” (Legal Services Commissioner, 2017), we suggest that an appropriate regulatory response to all of these is likely to require a fine balancing act between the competing interests of consumers, the legal market, the legal profession and access to justice (Wallace, 2017).
6 Conclusions and next steps

This paper has sought to identify the current state of ALAT development, to consider how ALATs are disrupting the legal industry and creating challenges for regulators.

ALATs use a range of technologies to offer different ways of providing legal advice. ALATs exist at different stages: some give legal advice autonomously or supervised, some assist or enable legal advice, and some unbundle and change legal advice. Indeed, the emergent technologies such as blockchain are being used to code legal outcomes in smart contracts that have the limited involvement humans as either lawyers or clients.

ALATs are being greatly enabled by accelerating technology however progress is not as fast as the hype would have it appear. Most ALATs tend to be smart and smarter rather than truly more (artificially) intelligent. As ALATs continue to evolve and the numbers grow, this is likely to change.

The study so far points to the existence of a digital divide. Currently the majority of ALATs operate in niche and specialised areas of law. Their use seems segmented across the legal services industry, linked to the ability to invest. ‘Enabling’ ALATs are more concentrated within the large corporate hemisphere while the legal assistance sector has seen a greater proliferation of lower tech apps and chatbots. The proprietary and commercial nature of some ‘in-house’ ALATs is likely to keep costs high, and, for the present, diminishes the potential for smaller firms to benefit from economies of scope and scale. This may change as and when more ‘white label’ applications enter the market.

As for regulation, this paper suggests that we are now approaching a tipping point in terms of regulatory action. ALATs are raising many regulatory issues that have not adequately been explored. These include questions about the way technology affects the duty of competence, and how the use of technology raises new implementation and supervision risks that need specific answers. The analysis in this paper also points to the need to revisit the legal information/legal advice distinction. This may actually prove the greatest of the challenges identified, raising large questions about the public interest, access to justice, and the potentially disruptive role not just of technology but of legal services regulation itself.

This paper seeks to contribute to the emerging debate from an independent, academic perspective on regulation and policy-making. To that extent, it both complements and is distinct from recent profession-centric contributions, such as the Law Society of NSW FLIP Inquiry (2017), the Law Institute of Victoria’s Disruption, Innovation and Change (2015) and the Law Society of Western Australia’s The Future of the Legal Profession (2017).

The next phase of this research is to gather the views from a range of stakeholders – members of the profession, regulators, ALAT developers and producers and access to justice groups about the impact of ALATs across the legal services industry. This second phase of this research will add a useful cross-section of views exploring emerging issues, key problems, and their potential solutions.
Appendix A: Examples of ALATs

This Appendix provides a selection of current examples of ALATs from the UK, US and Australia. The list is not comprehensive but aims to capture the breadth and diversity of ALATs in the market.

The ALATs were not tested in practice. The information was obtained from publicly available materials, such as websites. The About section of each ALAT provides a summary from the website advertising the product to provide a short description. These are from the tool listed. Other sources are attributed.

Please contact the research team if you seek to have your automated legal advice tool included in any future iterations of this paper.

The format for each Example is:

Name (Country)

<table>
<thead>
<tr>
<th>Country</th>
<th>Owner/Vendor</th>
<th>Date created</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website</td>
<td>Cost</td>
<td>Free and/or $ (Commercial)</td>
</tr>
<tr>
<td>Tech rank</td>
<td>Users</td>
<td>Public, Lawyers</td>
</tr>
<tr>
<td>Types of tech</td>
<td>Examples include: natural language processing, machine learning, blockchain, decision tree</td>
<td></td>
</tr>
<tr>
<td>About</td>
<td>A short description of the tool, its purpose and objectives from the company</td>
<td></td>
</tr>
</tbody>
</table>
### A.1 Legal chatbots

#### A.1.1 DoNotPay (US, UK)

<table>
<thead>
<tr>
<th>Name</th>
<th>DoNotPay</th>
<th>Date created</th>
<th>Sep 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>US, UK</td>
<td>Owner/Vendor</td>
<td>Joshua Browder, Stanford University student</td>
</tr>
<tr>
<td>Website</td>
<td>Donotpay.co.uk</td>
<td>Cost</td>
<td>Free</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Natural language processing, statistical machine learning, decision tree to guide the interaction.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| About         | The most successful and well known “robolawyer” was developed by Joshua Browder as a student at Stanford. Called DoNotPay, it is a free chatbot that fights parking tickets. It asks a series of questions about your case, such as: Were the signs clearly marked? Were you parked illegally because of a medical emergency? and then the website’s algorithm generates a legal letter that can be filed with the appropriate agency. As at June 2016, the bot had helped more than 250,000 people fight parking tickets in London, New York, and Seattle with a 40% success rate.  

Browder recently added new functions including to help people demand compensation from airlines for delayed flights and file paperwork for government housing assistance. He later expanded it to provide free legal aid to the homeless and to help refugees seeking asylum in the US and Canada. More are on the way (Koebler, 2017).  

Browder’s motivation is enabling access to the law, stating “I think it is a huge shame that those most likely to make a mistake and get a ticket are the most vulnerable members of society — the elderly and disabled. That’s why this is a free service” (Weather & Hale, 2016). Browder said that he ultimately hopes to replace “25,000 exploitative lawyers” with robots that can respond to questions with appropriate human emotions powered by artificial intelligence (Boyce, 2016).  


#### A.1.2 LISA (UK)

<table>
<thead>
<tr>
<th>Name</th>
<th>Robot Lawyer LISA</th>
<th>Date created</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>UK</td>
<td>Owner/Vendor</td>
<td>Chrissie Lightfoot, Adam Duthie, AI Tech Support.</td>
</tr>
<tr>
<td>Website</td>
<td>robotlawyerlisa.com</td>
<td>Cost</td>
<td>Free</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Use the Neota Logic AI platform for creating code-free apps</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| About         | A free legal tool that allows users to create legally binding Non-Disclosure Agreements (NDAs) in less than 7 minutes at no cost. The robot, named LISA, intelligently drafts the documents while helping them understand the legal and commercial principles on which it is based.  

“Our goal is to make every day basic legal services accessible and affordable to the masses of students, consumers and business people who are unhappy with, or overly reliant on, human lawyers and law firms”.

|
## A.1.3 Lexi (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Lexi the Legal Bot</th>
<th>Date created</th>
<th>Mid 2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>UK, US, Australia</td>
<td>Owner/Vendor</td>
<td>LawPath</td>
</tr>
<tr>
<td>Website</td>
<td>try.lawpath.com.au/privacy-bot/</td>
<td>Cost</td>
<td>Free and/or $ (Commercial)</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Natural language processing, statistical machine learning, decision tree to guide the interaction, interaction is using a form of rules, probably an ‘expert system’, to process user information that is filtered through hundreds of rules and logical causal connections.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About</td>
<td>LawPath, a technology provider of online legal services for businesses, recently released Lexi as an intelligent legal bot to “better help clients seeking customised legal documents”. As an experimental prototype in automated delivery, Lexi provides privacy law information and generates a free privacy policy or non-disclosure agreement tailored by user input to that user’s needs. The information and documents are delivered through online interactive chat. The software combines machine learning and natural language processing principles to process user information that is filtered through rules and logical causal connections. The end result is a document that matches user queries. “The problem with forms, traditionally, is that they really haven’t been able to give insight and educate as a bot does, whilst delivering the outcome as well,” Mr Andreasen said (<a href="http://www.lawyersweekly.com.au/news/19105-chatbot-explores-frontiers-of-legal-service">www.lawyersweekly.com.au/news/19105-chatbot-explores-frontiers-of-legal-service</a>),</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
A.1.4 Others in the US, UK and Australia

In 2017 Stanford’s 2017 Codex FutureLaw conference ran a session on “The rise of the legal chatbots”.

Another author, Ambrogi has listed some legal chatbots in abovethe@law.com (Ambrogi, 2017b). Chatbots designed for consumers and small businesses include:

- **Coralie** (US), a virtual assistant chatbot that helps survivors of military sexual trauma connect with services and resources. It recently won the Tech for Justice hackathon during the ABA Techshow.

- **Docubot**, a chatbot that works through lawyers’ websites to help consumers generate legal documents and that also performs client intake.

- **LawDroid**, a bot that helps users incorporate a business for free on a smartphone.

- **LawGeex LawBot**, a chatbot that can be added to Slack (a cloud-based collection of proprietary team collaboration tools and services), and then sends legal contracts for analysis (https://blog.lawgeex.com/lawgeex-launches-first-ever-law-bot-slack/).

- **RentersUnion** (UK) is a chatbot that provides legal advice on housing issues for residents of London. The bot analyzes a user’s tenancy agreement and then helps generate letters or recommend appropriate action.

- **Speak with Scout** (Australia) is a chatbot that works through AI and also humans via Facebook Messenger to provide legal guidance and references to a lawyer.

Other chatbots are being developed to “make lawyers’ lives easier”

- **Termi** (UK) owned by business intelligence and analytics company Helm360 is an AI assistant for lawyers. As Joanna Goodman explains in The Law Society Gazette, Termi interrogates the Thomson Reuters Elite legal practice management system to request billing and other management information.

Some law firms are developing their own chatbots.

- **Conveybot**: a chatbot owned by UK conveyancing firm Convey Law (UK) claimed to be “the first fully automated chatbot that can engage with conveyancing clients”, provide instant fee quotes and then arrange a follow-up conversation with a member of the firm.
A.2 Legal apps

A.2.1 Legal Aid NSW (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Date created</th>
<th>Country</th>
<th>Owner/Vendor</th>
<th>Website</th>
<th>Cost</th>
<th>Tech rank</th>
<th>Users</th>
<th>About</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal Aid NSW app</td>
<td>2015</td>
<td>Australia</td>
<td>Legal Aid NSW</td>
<td><a href="www.legalaid.nsw.gov.au">www.legalaid.nsw.gov.au/get-legal-help/legal-aid-nsw-app</a></td>
<td>Free</td>
<td>Natural language processing, statistical machine learning, decision tree</td>
<td></td>
<td>The Legal Aid NSW app gives you easy access to information about Legal Aid NSW services and the law. It covers searching for a Legal Aid NSW service, videos about the law, workshop about the law and access to factsheets and resources. Users can find out how to get a grant of legal aid and what to do if they are not eligible. Plus pay their contribution towards the legal costs of their case. Lawyers and community workers can use it to search for a private lawyer who carries out legal aid work (<a href="www.legalaid.nsw.gov.au">www.legalaid.nsw.gov.au</a>).</td>
</tr>
</tbody>
</table>

A.2.2 Picture It Settled (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>Date created</th>
<th>Country</th>
<th>Owner/Vendor</th>
<th>Website</th>
<th>Cost</th>
<th>Tech rank</th>
<th>Users</th>
<th>About</th>
</tr>
</thead>
<tbody>
<tr>
<td>Picture It Settled</td>
<td>2014</td>
<td>US</td>
<td>Don Philbin, Southwest Research Institute</td>
<td><a href="www.pictureitsettled.com">www.pictureitsettled.com</a></td>
<td>Free</td>
<td>Big data, predictive analytics</td>
<td></td>
<td>Picture It Settled® helps you visualize the negotiation dance and calculate your next steps. The Picture It Settled app is “Moneyball for negotiation”. The behavioral software has learned negotiating patterns from parties to thousands of litigated cases in a wide variety of jurisdictions and claim types. It uses that intelligence to make accurate predictions of where a negotiating round is headed in time for parties to act on it using the program’s planning tools. The planning tools allow users to fine-tune their target settlement and project what impact a particular move might have on the round before making it. The result is more settlements on more advantageous terms (Crunchbase).</td>
</tr>
</tbody>
</table>
### A.2.3 Robot Lawyers Australia (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Robot Lawyers Australia</th>
<th>Date created</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Australia</td>
<td>Owner/Vendor</td>
<td>Bill Doogue, Andrew George of Doogue + George Defence Lawyers</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.robot-lawyers.com.au">www.robot-lawyers.com.au</a></td>
<td>Cost</td>
<td>Free</td>
</tr>
<tr>
<td>Tech rank</td>
<td>TBA</td>
<td>Users</td>
<td>🐼</td>
</tr>
</tbody>
</table>

**About**

A free online service for people who are pleading guilty to theft, driving, assault, drug or drink/drug driving charges before the Magistrates’ Court of Victoria. The service aims to assist users to let the court know about circumstances relevant to sentencing. The user completes an online interview about issues relevant to their sentence. The user may be referred to a lawyer, eg, if an answer suggests that imprisonment is a risk. The interview includes questions asked by a lawyer both about the office and also about the person such as whether the user has “learned anything positive from [their] offending”. Then “robot lawyer” emails the user a document that can be used by the magistrate, as well as copies of the answers (a Personal Instructions document) and a Character Reference guide (K. Miller, 2017).

### A.2.4 Neota Logic and Hive Legal Superannuation App (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Hive Legal Super App</th>
<th>Date created</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Australia</td>
<td>Owner/Vendor</td>
<td>Hive Legal (founded 2014)</td>
</tr>
<tr>
<td>Website</td>
<td>hivelegal.com.au/tools/</td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td>TBA</td>
<td>Users</td>
<td>🐼 Regulated superannuation funds</td>
</tr>
</tbody>
</table>

**Types of tech**

Formal logic and weighted criteria decision making

**About**

NewLaw firm Hive Legal, established in February 2014 with a focus on using technology to provide its clients with efficient solutions, has developed the Hive Legal Super App in conjunction with Neota Logic as a legal techspert combination. “It is part of Hive Legal’s DNA to combine its highly sophisticated legal expertise with the power of intelligent technology like Neota Logic” (Jodie Baker, managing director, Hive Legal) (Bullock, 2016).
### A.2.5 Helper (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Date created</th>
<th>Owner/Vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legal Aid Case-Helper</td>
<td>2017</td>
<td>Bryon White, Joseph O’Neill, Rachel Hovenden and Jessy Xie, Melbourne Law School with Neota Logic</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Country</th>
<th>Website</th>
<th>Cost</th>
<th>Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>TBA care of <a href="http://www.neotalogic.com">www.neotalogic.com</a></td>
<td>Free</td>
<td>Legal Aid Clients</td>
</tr>
</tbody>
</table>

#### About
Legal Aid Case-Helper is an example of a winning app developed by four law students at Melbourne Law School. It assists clients of Victoria Legal Aid (VLA) to provide lawyer services free of charge when the clients need help navigating the court system. The technology was provided by Neota Logic. “It’s exciting to see how law students apply Neota Logic’s technology to address legal and business issues in novel ways” (Julian Uebergang, Managing Director Asia Pacific, Neota Logic).

### A.3 Virtual assistants

#### A.3.1 Riverview Law (UK)

<table>
<thead>
<tr>
<th>Name</th>
<th>Date created</th>
<th>Owner/Vendor</th>
<th>Website</th>
<th>Cost</th>
<th>Users</th>
</tr>
</thead>
</table>

#### About
Riverview Law has been a leading technology adapter for legal services. In April 2016 it released two versions of Virtual Assistant that automate taking instructions, triaging and case management processes – with a standard Foundation VAs and a Professional VAs that is more customisable for law firms. The Virtual Assistants are powered by KIM Technologies, a “next generation provider of software that applies artificial intelligence capabilities to knowledge automation”.
### A.3.2 Termi (UK)

<table>
<thead>
<tr>
<th>Name</th>
<th>Termi</th>
<th>Date created</th>
<th>April 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>UK/US</td>
<td>Owner/Vendor</td>
<td>Helm 360</td>
</tr>
<tr>
<td>Tech rank</td>
<td><img src="http://example.com/rating.png" alt="Rating" /></td>
<td>Users</td>
<td><img src="http://example.com/rating.png" alt="Rating" /></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Natural language processing, statistical machine learning, and voice.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**About**

Business intelligence and analytics company Helm360 has launched Termi, as part of its business solution offerings. Termi is a voice-activated tool that appears on the screen as an avatar. It is focused on internal processes rather than client services.

It is designed to turn management information into actionable content, “remove complexity and give users mobile access to relevant information without logging into multiple platforms” (Dave quoted in Goodman, 2017).

It is built on Microsoft’s cognitive services platform that interrogates Thomson Reuters legal practice management systems via, eg, Skype, Team or a web browser (Goodman, 2017).

### A.3.3 FTA Portal (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>FTA Portal</th>
<th>Date created</th>
<th>April 2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Australia</td>
<td>Owner/Vendor</td>
<td>Data61 with Australian Department of Foreign Affairs and Trade</td>
</tr>
<tr>
<td>Tech rank</td>
<td><img src="http://example.com/rating.png" alt="Rating" /></td>
<td>Users</td>
<td><img src="http://example.com/rating.png" alt="Rating" /></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Natural language processing, Information retrieval (probably with statistical machine learning)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**About**

In Australia, DFAT has worked with data innovation company, Data 61, to make Free Trade Agreements accessible via a pilot Free Trade Agreement Portal. Hosted on the DFAT website, it is a service that guides farmers on the 900-page legal regulations around exporting goods from Australia.

“You can type it in plain English and the system will give you an answer. It’s not the same service you’d get from a $500-an-hour lawyer, but it’s a starting point. It tells you enough”. This means you don’t need to know that beef is officially called ‘meat of bovine animals’ to get you started ([www.data61.csiro.au](http://www.data61.csiro.au)).
## A.4 Legal document automation

### A.4.1 Exari DocGen (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>Exari DocGen</th>
<th>Date created</th>
<th>1999</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Australia (also US, UK, EU)</td>
<td>Owner/Vendor</td>
<td>Justin Lipton, Jamie Wodetzki of Exari Systems</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.exari.com">www.exari.com</a></td>
<td>Cost</td>
<td></td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>To advise</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**About**

Exari Systems is an automated document assembly and contract automation software company. Exari software uses a web-browser interface to enable business people to create their own contracts using the templates created by their legal department. This approach accelerates the contracts process and reduces the burden on busy legal departments.

Exari DocGen uses an intuitive, browser-based interview to generate any type of contract. To gather the necessary contract information, users simply answer a dynamic set of questions, instinctively grouped by topic. This information then populates the contract template, creating a compliant, accurate contract in record time. And with Exari’s authoring tools, it’s never been easier for companies to create the contract templates that power the DocGen engine.

### A.4.2 Clerky (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>Clerky</th>
<th>Date created</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>US</td>
<td>Owner/Vendor</td>
<td>Chris Field, Darby Wong</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.clerky.com">www.clerky.com</a></td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>To advise</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**About**

Offering automated legal paperwork for start-ups, Clerky currently provides company incorporation documents and is privately trialling automated fundraising and commercial documents (such as non-disclosure agreements and employment agreements). Currently only US (Gardner, 2017).

Clerky provides the easiest way for startups to get legal paperwork done safely. We’re 100% focused on helping startups get legal paperwork done safely, going far beyond simply providing forms. Get your legal paperwork done with confidence, so you can get back to building your company.
A.5 Legal document review

A.5.1 Kira Systems (Canada)

<table>
<thead>
<tr>
<th>Name</th>
<th>Kira Systems</th>
<th>Date created</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Canada</td>
<td>Owner/Vendor</td>
<td>Alexander Hudek, Noah Waisberg, Alliance with Deloitte, KPMG, etc.</td>
</tr>
<tr>
<td>Website</td>
<td>kirasystems.com</td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Combines natural language processing and machine-learning. The system responds to queries without requiring particular terminology, and its output becomes increasingly accurate as it learns from experience and feedback.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About</td>
<td>Kira Systems undertakes mergers and acquisitions, due diligence and – for this category - contract analysis.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A.5.2 Seal (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>Seal</th>
<th>Date created</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>US</td>
<td>Owner/Vendor</td>
<td>Kevin Gidney, Ulf Zetterberg</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.seal-software.com">www.seal-software.com</a></td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Uses machine learning, deep learning and AI to find contracts and extract data.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About</td>
<td>Seal is a leading provider of Contract Discovery and Analytics. Contract Discovery and Analytics software is a class of artificial intelligence technology purpose-built and extensively trained to discover and extract critical data from legal documents. Having a clear vision into your contractual relationships is critical. Knowing the risks, obligations, and opportunities with third parties is required for dealing with business, legal, or regulatory changes. This visibility is also a valuable and untapped source of intelligence for improving overall business performance. Our software tells you where all your contracts are and what they contain, at scale.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### A.5.3 Contract Probe (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Contract Probe</th>
<th>Date created</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Australia</td>
<td>Owner/Vendor</td>
<td>Michael Pattison Funded by Mills Oakley</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.contractprobe.com">www.contractprobe.com</a></td>
<td>Cost</td>
<td>$</td>
</tr>
</tbody>
</table>

**Tech rank**

Users

**Types of tech**

Algorithm, machine learning, and AI.

**About**

ContractProbe reviews a contract and generates a report within 15 seconds, providing a quality “score”. Clients could use the score as a benchmark to pass through some contracts without human oversight at all. It has been “trained” on thousands of executed non-disclosure agreements, consultancy agreements, employment agreements and technology licences. It also has an artificial intelligence “front-end” capable of learning from new contracts it processes, so that it can identify missing clauses or unusual clauses. “It goes so far as to suggest a sample clause where it knows one is missing, but that just goes into the report rather than the document itself, we don’t want to cross the line into providing legal advice,” said Mr Pattison. Early testing by lawyers revealed a 40% increase in efficiency by those using ContractProbe against a control group (Bailey, 2017).

### A.5.4 LawGeex LawBot (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>LawGeex LawBot</th>
<th>Date created</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>US</td>
<td>Owner/Vendor</td>
<td>Noory Bechor and Ilan Admon</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.lawgeex.com">www.lawgeex.com</a></td>
<td>Cost</td>
<td>$</td>
</tr>
</tbody>
</table>

**Tech rank**

Users

**Types of tech**

Machine learning, text analysis and natural language processing.

**About**

The LawGeex Artificial Intelligence engine reviews, reads and analyses incoming contracts, and highlights any issues suggesting edits based on a company’s pre-defined legal policies. Contracts that meet these policies can be automatically approved within an hour. Contracts that don’t align with policies are escalated to a human for guided editing and approval.
A.6 Legal artificial intelligence

A.6.1 ROSS Intelligence (Canada/US)

<table>
<thead>
<tr>
<th>Name</th>
<th>ROSS Intelligence</th>
<th>Date created</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Canada/US</td>
<td>Owner/Vendor</td>
<td>Jimoh Ovbiagele, Andrew Arruda, Pargles Dall’Oglio, Akash Venkat</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.rossintelligence.com">www.rossintelligence.com</a></td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Natural language processing + statistical machine learning. Built on IBM’s Watson artificial intelligence that uses cloud-based predictive analytics and cognitive computing services embedded in Watson’s analytics engine.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About</td>
<td>Ross Intelligence does more than humanly possible. The tool supercharges lawyers with artificial intelligence. ROSS, promoted as the world’s first artificially intelligent lawyer”, is built on IBM’s Watson artificial intelligence. It is designed to perform legal research while approximating the experience of working with a human lawyer. It can understand questions asked in natural language, analyses the questions, then goes through the body of law to provide specific, analytic answers. On average, it takes a few seconds (Rinaldi, 2017). In the past year, more than 10 major law firms have “hired” Ross (see the Ross Website).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A.6.2 Ailira (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Ailira</th>
<th>Date created</th>
<th>201?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Australia</td>
<td>Owner/Vendor</td>
<td>Adrian Cartland, Cartland Law</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.Ailira.com">www.Ailira.com</a></td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Natural Language processing + statistical machine learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About</td>
<td>Ailira is developed in Australia and named Ailira after the Artificially Intelligent Legal Information Research Assistant. Ailira automates legal advice (for consumers) and automates legal research (for lawyers). Currently the focus is Australian federal tax research, extending to assist victims of domestic violence having won the D3 challenge (see the Ailira website). From November 2017, Ailira is being used to assist a Darwin, Northern Territory law firm to draft virtual wills (Marks, 2017).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## A.6.3 Ravn ACE (UK)

<table>
<thead>
<tr>
<th>Name</th>
<th>Applied Cognitive Engine (ACE)</th>
<th>Date created</th>
<th>2010, AI in 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>UK</td>
<td>Owner/Vendor</td>
<td>Peter Wallqvist</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.ravn.co.uk">www.ravn.co.uk</a></td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td><strong>Types of tech</strong></td>
<td>Natural Language processing and Machine Learning areas of artificial intelligence</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **About**             | “We derive structure from chaos”.  
Ravn uses artificial intelligence analytical ACE platform technology which reads, organises, discovers and summarises unstructured data such as legal documents. It adds specific business solutions on top of the ACE platform such as compliance.  
In 2017 Ravn launched an analytical tool to predict and forecast outcomes by analysing historical data. A typical use is the ability to predict the cost of legal matters and other types of projects using AI algorithms on data surfaced using the ACE platform (AI Business, 2017). Note: RAVN’s Extract is a plug-and-play version of the ACE product. |

## A.7 Legal algorithms

### A.7.1 COMPAS Core (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>COMPAS CORE</th>
<th>Date created</th>
<th>?</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>US</td>
<td>Owner/Vendor</td>
<td>Northpointe (owned by Equivant)</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.equivant.com/solutions/inmate-classification">www.equivant.com/solutions/inmate-classification</a></td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td>Judges</td>
</tr>
<tr>
<td><strong>Types of tech</strong></td>
<td>This company keeps the details of their algorithm private as commercial. Must be using statistical machine learning to do these predictions.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
| **About**             | In many US states, judges use software called COMPAS CORE to help with setting bail and deciding whether to grant parole for offenders recently removed from or currently in the community e.g. jail, probation, community corrections, etc. ([www.equivant.com](http://www.equivant.com)).  
A software algorithm develops a score to predict the risk an offender will commit a new violent crime, be likely to re-offend or be a flight risk. The software uses information from a survey with over 137 questions ranging from informing demographics such as gender, age, criminal history, and personal relationships (although not race), asking questions such as “Was one of your parents ever sent to jail or prison?” “How many of your friends/acquaintances are taking drugs illegally?” and “How often did you get in fights at school?” and requests you to agree/disagree with statements such as “A hungry person has a right to steal” (Angwin et al., 2016). |
### A.7.2 Divorce Right (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Divorce Right</th>
<th>Date created</th>
<th>2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Australia</td>
<td>Owner/Vendor</td>
<td>Anne-Marie Cade, owner Victorian online legal firm Daniel Lew Le Mercier &amp; Co</td>
</tr>
<tr>
<td>Website</td>
<td>divorceright.com.au</td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td>Divorce clients, divorce lawyers</td>
</tr>
<tr>
<td>Types of tech</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**About**

Australian startup DivorceRight focuses on the divorce process, aiming to make it as easy as possible and keep families out of court. It does this by completing as much of the divorce process online. DivorceRight uses an algorithm to assist in the division of property. The algorithm takes into account how each party ranks a list of non-allocated marital property from most to least preferred and divides it (Baldassarre, 2015).

---

### A.8 Legal data analytics and prediction

#### A.8.1 Lex Machina (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>Lex Machina</th>
<th>Date created</th>
<th>2009</th>
</tr>
</thead>
<tbody>
<tr>
<td>Website</td>
<td>lexmachina.com/legal-analytics</td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td>Law firms, leading companies, consultants, public interest users</td>
</tr>
<tr>
<td>Types of tech</td>
<td>Natural language processing and statistical machine learning.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**About**

Lex Machina offers “moneyball lawyering” (Salian, 2017). It applies natural-language processing technology developed at Stanford University to the big data of millions of court decisions and other legal information to find strategic insights on judges, lawyers, parties, and more. This allows law firms and companies to predict the behaviours and outcomes that different legal strategies will produce, enabling them to win cases and close business (see the website). Originally using intellectual property litigation data and predictive analytics, now owned by LexisNexis, it has broadened to delivery as Software-as a-Service. As an example, its case analysis tool can show which judges tend to favour plaintiffs, summarize the legal strategies of opposing lawyers based on their case histories, and determine the arguments most likely to convince specific judges.
## A.8.3 Ravel (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>Ravel</th>
<th>Date created</th>
<th>May 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>US</td>
<td>Owner/Vendor</td>
<td>Founded by Nik Reed, Daniel Lewis (ex Stanford Uni)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>In 2012, Ravel spun out of Stanford University’s Law School, Computer Science Department, and d.school, with the support of CodeX (Stanford’s Center for Legal Informatics)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Purchased by LexisNexis 2017</td>
</tr>
<tr>
<td>Website</td>
<td>ravellaw.com/</td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td>3</td>
<td>Users</td>
<td>Law firms, law students</td>
</tr>
<tr>
<td>Types of tech</td>
<td>Natural language processing and statistical machine learning.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About</td>
<td>Ravel Law is a legal search, analytics, and visualization platform. Ravel assists lawyers to find, contextualize, and interpret information that turns legal data into legal insights. Ravel’s sets of tools include data-driven, interactive visualisations and analytics, enabling lawyers to better understand trends, the law and prepare for litigation (<a href="http://ravellaw.com/next-step-in-our-journey">http://ravellaw.com/next-step-in-our-journey</a>).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

## A.8.4 Premonition (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>Premonition</th>
<th>Date created</th>
<th>March 2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>US, UK</td>
<td>Owner/Vendor</td>
<td>Toby Unwin, Guy Kurlandski</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.premonition.ai">www.premonition.ai</a></td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td>3</td>
<td>Users</td>
<td>Lawyers, Courts</td>
</tr>
<tr>
<td>Types of tech</td>
<td>Statistical machine learning</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About</td>
<td>“Which attorneys win before which judges? Premonition knows”. Premonition also uses predictive legal technology, accessing data from litigation databases. It can predict the winner of a case before it goes to court, based on statistical analyses of verdicts in similar cases.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>It’s obvious, but nobody does it. People pick attorneys based on recommendations from friends, online reviews, because they’re friends, friends of friends, went to a particular law school, have nice offices, work for a well-known firm, saw an advertisement, their name was first in the phone book, etc. Years ago, we started collecting lists of “the best” attorneys in various specialties. Recently, using the Premonition system, we took a look at the leading lists, people who are recognized by their peers as being “the best”. It turns out they’re average. The only way that they stood out was a disproportionate number of appeals and re-opened cases, i.e. they’re good at dragging out litigation (see the website).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### A.9 Human-free smart contracts

#### A.9.1 AgriDigital (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>AgriDigital</th>
<th>Date created</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Australia</td>
<td>Owner/Vendor</td>
<td>Emma Weston, Bob McKay, Ben Reid</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.agridigital.io">www.agridigital.io</a></td>
<td>Cost</td>
<td>Free and/or $ (Commercial)</td>
</tr>
<tr>
<td>Tech rank</td>
<td>📘 📘 📘</td>
<td>Users</td>
<td>🍤</td>
</tr>
<tr>
<td>Types of tech</td>
<td>Blockchain, statistical machine learning, and a decision tree to guide the interaction.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**About**

“AgriDigital software solutions simplify commodity management, revolutionise supply chain finance, and bring traceability to your agribusiness”.

AgriDigital ran a pilot of the world’s first wheat sale using a pilot blockchain ledger and smart contract code (Bacina, 2017).

AgriDigital software platforms are designed to assist in the transaction and settlement of agricultural commodities and to manage supply chain risk. Through applied blockchain technologies, distributed ledgers and smart contracts, AgriDigital provides “real time payment to growers, increased efficiencies for brokers, flexible supply chain for buyers and financiers, and paddock to plate transparency for consumers”.
## A.10 NewLaw business models

### A.10.1 Legal Zoom (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>Legal Zoom</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>US &amp; other countries</td>
</tr>
<tr>
<td>Website</td>
<td><a href="https://www.legalzoom.com/country/au">www.legalzoom.com/country/au</a> (Australia)</td>
</tr>
<tr>
<td>Tech rank</td>
<td><img src="https://example.com/icon.png" alt="User/Developer Icon" /> <img src="https://example.com/icon.png" alt="User/Developer Icon" /></td>
</tr>
<tr>
<td>Cost</td>
<td>Affordable</td>
</tr>
<tr>
<td>Owner/Vendor</td>
<td>Eddie Hartman, Brian Liu, Brian Lee</td>
</tr>
<tr>
<td>Date created</td>
<td>Dec 1999/2001(?)</td>
</tr>
<tr>
<td>Users</td>
<td>Individuals, families, and small businesses</td>
</tr>
<tr>
<td>Types of tech</td>
<td>Automation technology</td>
</tr>
</tbody>
</table>

**About**

"LegalZoom is a trusted technology platform giving access to professional legal advice, so people can protect what matters most".

We didn’t start out to be disruptive,” says John Suh, LegalZoom’s CEO. "We were set up to fix a problem. The legal system was broken, and too many people were frozen out of it” (Brescia).

LegalZoom provides high quality online legal document services and affordable legal plans with access to experienced attorneys to individuals, families and small businesses. Its goal is to provide access to the legal system for the 84% of Americans and the vast majority of small businesses who can’t afford an attorney and do not qualify for free legal services.

LegalZoom is now in its third “chapter”. The LegalZoom model specialises in identified areas of law where written information, forms, and legal advice can serve a large number of clients, meaning they can build economies of scale and bring the cost of services down considerably, “often 80% lower than what a lawyer would charge” (Brescia p762). Suh sums up the LegalZoom business model as involving:

“Scale (including in mass market advertising), lots of volume within a specialized area, high repetition, leveraging lawyers that are extremely well-versed in that particular field and developers that know how to codify the law within the technology, so we can deliver the same experience each and every time … We’re really about technology-enabled lawyers. And we think that’s the future” IBA 54.
**A.10.2 Rocket Lawyer (US)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Date created</th>
<th>Owner/Vendor</th>
<th>Country</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rocket Lawyer</td>
<td>August 2008</td>
<td>Charley Moore (US)</td>
<td></td>
<td>Free to $</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.RocketLawyer.com">www.RocketLawyer.com</a></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tech rank</td>
<td><a href="https://rocketlex.com">https://rocketlex.com</a></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Automation technology</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**About**

Founded in August 2008, Rocket Lawyer aims to provide simple and affordable online legal services for everyone. Since then, the company has helped over 20 million families and small businesses take care of their legal matters. Users can get free legal documents, seek legal advice, create legal documents online, have documents reviewed for packaged and discounted rates with attorneys (www.crunchbase.com/organization/rocketlawyer).

At Rocket Lawyer, we want to change things by making legal services affordable, simple and available to more people than ever before. We combine free legal documents and free legal information with access to affordable representation by licensed attorneys.

**A.10.3 Riverview Law (UK)**

<table>
<thead>
<tr>
<th>Name</th>
<th>Date created</th>
<th>Owner/Vendor</th>
<th>Country</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Riverview Law</td>
<td>2012</td>
<td>Riverview Law (UK)</td>
<td></td>
<td>$ For profit</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.riverviewlaw.com">www.riverviewlaw.com</a></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Multiple using the KIM (Knowledge Information Meaning) platform.</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**About**

In 2012 the company entered the market with a bang, promising to be a “legal disruptor” that would do things differently.

Riverview Law has a fixed priced model for services to provide customers with budget certainty. The business model is built from the customer up, not the law firm partner down, with the strapline – ‘Legal input. Business output.’ – which tells clients what they can expect from us; high quality legal advice and support provided in the context of their business, risk appetite and their tactical and strategic commercial drivers. All of which are underpinned by talented people, effective processes, scalable technology and a customer-centric culture.

KIM has several levels as an AI platform based on IBM Watson. It builds workflows being a service software (as compared to Software-as-a-Service), manages workload and, on an enterprise level, supports expert decision-making (Goodman, 2016).
### A.10.4 Legal Vision (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Legal Vision</th>
<th>Date created</th>
<th>2012</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Country</strong></td>
<td>Australia</td>
<td>Owner/Vendor</td>
<td>Lachlan McKnight, Ursula Hogben, Evan Tait-Styles Part-owner Gilbert &amp; Tobin in 2016 (20%)</td>
</tr>
<tr>
<td><strong>Website</strong></td>
<td>legalvision.com.au</td>
<td>Cost</td>
<td>$ fixed-fee</td>
</tr>
<tr>
<td><strong>Tech rank</strong></td>
<td>🍴🍴🍴</td>
<td>Users</td>
<td>Originally small and medium businesses, also corporations and in-house legal teams</td>
</tr>
<tr>
<td><strong>Types of tech</strong></td>
<td>Machine learning and automated document technology.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### About

LegalVision was born in 2012 as an online legal documents business that enabled users to build their own documents online. Over 40 documents are free at the website, more complex and tailored versions see fixed-fee legal costs.

In 2014 Legal Vision adapted its model to become an incorporated legal practice (ILP) that is a “full service law firm that uses technological innovations to deliver legal services to clients in an efficient, cost effective way”. It continues to have a strong technology strategy that includes investing in machine learning, document technology, various apps and blockchain (Law Society of NSW, 2017 p49/51).

“We don’t subscribe to the view that technology is going to replace lawyers. Rather, we think it will free up time for lawyers to focus on the ‘value add’ aspects of their role”.

"W"
## A.11 Legal technology companies

More examples of legal technology companies serving the legal sector will be added in due course.

### A.11.1 Neota Logic Systems (US)

<table>
<thead>
<tr>
<th>Name</th>
<th>Neota Logic System (NLS)</th>
<th>Date created</th>
<th>Owner/Vendor</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>US, UK, Australia</td>
<td></td>
<td>Co-founder Michael Mills</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>APAC Julian Uebergang</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.neotalogic.com">www.neotalogic.com</a></td>
<td>Cost</td>
<td>$</td>
</tr>
<tr>
<td>Tech rank</td>
<td></td>
<td>Users</td>
<td></td>
</tr>
<tr>
<td>Types of tech</td>
<td>Formal logic and weighted criteria decision-making.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NLS consists of an AI-powered platform and toolset.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>About</td>
<td>Re-imagine Professional Services with Artificial Intelligence</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>NLS consists of an AI-powered platform and comprehensive toolset that allows professionals to rapidly build and deploy application solutions that automate their expertise, increasing productivity, improving client satisfaction and creating new business opportunities.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Neota Logic is a global provider of intelligent software for the legal and compliance industries. It has developed a number of smart applications by combining rules, reasoning, decision management, and document automation, thus enabling business solutions that deliver process improvements, reduce risk, and ensure compliance.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>The heart of NLS is our unique, proprietary hybrid reasoning engine. The Engine combines Boolean rules of any complexity with mathematical reasoning (formulas, Excel spreadsheets), multi-factor reasoning (weighted scorings), and a wide range of external tools, as illustrated. The Engine automatically integrates all these forms of reasoning—calling upon them as needed to drive an application and solve a problem. Authors can build very large and complex applications in individual, small, comprehensible segments that are easier to create and much easier to maintain. The Engine is designed and configured at Amazon Web Services for security, fault tolerance, high availability, and easy scaling to assure good performance at high levels of use (<a href="http://www.neotalogic.com/platform/reasoning-engine">www.neotalogic.com/platform/reasoning-engine</a>).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### A.11.2 Data 61 (Australia)

<table>
<thead>
<tr>
<th>Name</th>
<th>Data61</th>
<th>Date created</th>
<th>2016</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country</td>
<td>Australia</td>
<td>Owner/Vendor</td>
<td>CSIRO</td>
</tr>
<tr>
<td>Website</td>
<td><a href="http://www.data61.csiro.au">www.data61.csiro.au</a></td>
<td>Cost</td>
<td>Free &amp; $</td>
</tr>
<tr>
<td>Tech rank</td>
<td><img src="image" alt="Tech rank" /></td>
<td>Users</td>
<td><img src="image" alt="User" /></td>
</tr>
<tr>
<td>Types of tech</td>
<td>TBA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### About

Data61 is focused on “creating our data-driven future”. It combines the CSIRO Digital Productivity and NICTA teams to build a data-focused research and innovation powerhouse. It provides a network of capabilities, addressing key growth areas for a data-focused world including: Autonomous systems, Computer vision, Data analytics, Digital economy, Machine learning, Mobile systems, Optimisation, Software systems, Wireless and networks.

Data61 is working on exemplar applications, to help cut through dense laws and regulations that contribute to the $250 billion annual cost of red tape, with various organisations including the Australian Taxation Office and the Australian Building Codes Board. One app developed with PwC compares staff pay to awards and agreements to rapidly highlight discrepancies (Walsh, 2017).

A key project is Regulation as a Platform as a proof-of-concept project that aims to maximise the value of regulation, being the key data set of government. “We’re re-imagining regulation as an open platform based on digital logic to help support a growing ecosystem of digital regulation tools and services.” Under the National Innovation and Science Agenda: Platforms for Open Data framework, the Australian Government is exploring opportunities to maximise the value of public data for the benefit of all Australians. Data61 is working with government stakeholders to transform their rules into digital logic. It is a multi-stage process. It starts with parsing large amounts of legal text, automatically converting as much as possible into machine-readable logic. Then policy experts and regulators provide oversight of the digital logic to ensure the intent of the law is accurately represented. After quality checking, the rules are endorsed for publication by regulators and made publicly available on the Regulation as a Platform prototype. The ultimate aim is to provide free and open access to legislation and regulation via public APIs, which will allow users to access the database of endorsed logic rules and a reasoning engine to process rules and data into accessible digital logic.
## Appendix B: Technology definitions

Key definitions and terms used in this technological arena are explained in this section.

<table>
<thead>
<tr>
<th>Terminology</th>
<th>Definitions &amp; Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial Intelligence</td>
<td>AI is an “umbrella” concept that is made up of numerous technologies. Used in a general sense, it refers to the development of programs that can teach themselves to learn, understand, reason, plan, and act (that is, become more “intelligent”) when exposed to new data in the right quantities (Huff Eckert et al., 2016).</td>
</tr>
<tr>
<td>Artificial Intelligence – Soft</td>
<td>Also called ‘weak-AI’ or ‘narrow-AI’, is AI built for a specific domain with the capability of intelligent decisions of that context.</td>
</tr>
<tr>
<td>Artificial Intelligence – Hard</td>
<td>The most difficult AI problems are referred to as AI-complete or AI-hard implying the difficulty level of these computational problems is equivalent to solving the central AI problem of making computers as intelligent as people (AKA strong AI). To call a problem AI-complete means it would not be solved by a simple specific algorithm (en.wikipedia.org/wiki/AI-complete).</td>
</tr>
<tr>
<td>Artificial Intelligence – Strong</td>
<td>Artificial intelligence where computers are as intelligent as people and that aims to duplicate human intellectual abilities (Copeland, 2017).</td>
</tr>
<tr>
<td>Algorithms</td>
<td>Algorithms are mathematical instructions. An algorithm “is a step-by-step procedure for calculations” (Deangelis, 2014). That is, they take some values as an input and produce values, as output. An algorithm is “a sequence of computational steps that transform the input into the output” (Cormen, Leiserson, Rivest &amp; Stein, 2009, p5). It is an unambiguous specification of how to solve a class of problems. Algorithms can perform calculation, data processing and automated reasoning tasks. An algorithm is an effective method that can be expressed within a finite amount of space and time and in a well-defined formal language for calculating a function. Algorithms are instructions that a computer uses to transform a set, or sets of data, into an output. Algorithms are the basic techniques. However now, rather than follow only explicitly programmed instructions, some computer algorithms are designed to allow computers to learn on their own (i.e., facilitate machine learning) or to construct small programs on their own that work just for a specific context, are run once, and discarded immediately. Uses for machine learning include data mining and pattern recognition (Deangelis, 2014).</td>
</tr>
</tbody>
</table>
This diagram shows how analytics are developing from descriptive and diagnostic to predictive and even prescriptive analytical techniques. There are four types of big data analytics in a chain of evolution from descriptive to diagnostic to predictive, and culminating with prescriptive (Gartner, 2017):

- **Descriptive** – What is happening now based on incoming data.
- **Diagnostic** – A look at past performance to determine what happened and why.
- **Predictive** – An analysis of likely scenarios of what might happen.
- **Prescriptive** – This type of analysis reveals what actions should be taken. Many organizations are still in the descriptive stage.

(Anadiots 2016).

<table>
<thead>
<tr>
<th><strong>Terminology</strong></th>
<th><strong>Definitions &amp; Source</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Analytics – Descriptive to Prescriptive</strong></td>
<td></td>
</tr>
<tr>
<td><strong>App (abbreviation for Application)</strong></td>
<td>A small, specialised software program that is designed to perform a specific function for the user. It can run on the internet, your computer or as a download on mobile devices.</td>
</tr>
<tr>
<td><strong>Big Data</strong></td>
<td>Big data is a term for data sets that are so large or complex that traditional data processing application software is inadequate to deal with them. Big data challenges include capturing data, data storage, data analysis, search, sharing, transfer, visualisation, querying, updating and information privacy. Lately, the term “big data” tends to refer to the use of predictive analytics, user behaviour analytics, or certain other advanced data analytics methods that extract value from data, and seldom to a particular size of data set (Mayer-Schönberger &amp; Cukier 2013).</td>
</tr>
<tr>
<td>Terminology</td>
<td>Definitions &amp; Source</td>
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</table>
| Blockchain            | A blockchain is a decentralised distributed ledger (Jehl, 2018). The blockchain records transactions between two parties in a verifiable and permanent manner. When used as a distributed ledger, a blockchain is typically deployed in a distributed manner. With the network collectively adhering to a protocol for validating new blocks. Once validated these blocks are added to the chain. Once recorded, the data in any given block cannot be altered retroactively without the alteration of all subsequent blocks, which requires collusion of the network majority.  
  The first distributed blockchain was conceptualised in 2008 by an anonymous person/group known as Satoshi Nakamoto and implemented in 2009 as a core component of bitcoin where it serves as the public ledger for all transactions. (Tapscott & Tapscott, 2016)  
  Blockchains are potentially suitable for many records management activities, such as identity management, transaction processing, documenting provenance, or food traceability. Tapscott sees that blockchain technology has the potential to revolutionize the world economy (McKinsey & Company, 2016; Tapscott & Tapscott, 2016). |
| Bot / Chat Bot        | A chatbot (also known as a talkbot, chatterbot, Bot, IM bot, interactive agent, or Artificial Conversational Entity) is a computer program which conducts a conversation via auditory or textual methods. Such programs are often designed to convincingly simulate how a human would behave as a conversational partner, thereby passing the Turing test. Chatbots are typically used in dialog systems for various practical purposes including customer service or information acquisition. Some chatterbots use sophisticated natural language processing systems, but many simpler systems scan for keywords within the input, then pull a reply with the most matching keywords, or the most similar wording pattern, from a database.  
  The term “ChatterBot” was coined by Michael Mauldin in 1994 to describe these conversational programs (Mauldin, 1994). |
| Cognitive Computing   | At present, there is no widely agreed upon definition for cognitive computing in academia or industry.  
  Cognitive computing (CC) is a term used by IBM to refer to new hardware and/or software that mimics the functioning of the human brain (2004) and helps to improve human decision-making. In this sense, it is a new type of computing with the goal of more accurate models of how the human brain/mind senses, reasons, and responds to stimulus. CC applications link data analysis and adaptive page displays (AUI) to adjust content for a particular type of audience. As such, CC hardware and applications strive to be more affective and more influential by design (Kelly, 2016). |
<p>| Data visualisation    | The ability to visually display and interact with date for analysis and communication (Smith 2016). |</p>
<table>
<thead>
<tr>
<th>Terminology</th>
<th>Definitions &amp; Source</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Deep Learning</strong>&lt;br&gt;also known as Deep structured learning or Hierarchical learning</td>
<td>Deep learning is part of a broader family of machine learning methods based on learning data representations, as opposed to task-specific algorithms. Learning can be supervised, partially supervised or unsupervised. Some representations are loosely based on interpretation of information processing and communication patterns in a biological nervous system, such as neural coding that attempts to define a relationship between various stimuli and associated neuronal responses in the brain. Research attempts to create efficient systems to learn these representations from large-scale, unlabelled data sets. Deep learning architectures such as deep neural networks, deep belief networks and recurrent neural networks have been applied to fields including computer vision, speech recognition, natural language processing, audio recognition, social network filtering, machine translation, bioinformatics and drug design where they produced results comparable to and in some cases superior to human experts (Bengio, LeCun, and Hinton, 2015).</td>
</tr>
<tr>
<td><strong>Distributed ledger</strong></td>
<td>A distributed electronic ledger uses software algorithms to record and confirm transactions with reliability and anonymity. The record of events is shared between many parties and information once entered cannot be altered, as the downstream chain reinforces upstream transactions (Huff Eckert et al., 2016).</td>
</tr>
<tr>
<td><strong>Intelligence automation</strong></td>
<td>Intelligent automation—the combination of artificial intelligence and automation. Intelligent automation systems sense and synthesize vast amounts of information and can automate entire processes or workflows, learning and adapting as they go. Applications range from the routine to the revolutionary: from collecting, analysing, and making decisions about textual information to guiding autonomous vehicles and advanced robots (Schatsky &amp; Mahidar, 2014).</td>
</tr>
<tr>
<td><strong>Internet of Things (IoT).</strong></td>
<td>Network of objects — devices, vehicles, etc. — embedded with sensors, software, network connectivity, and computing capability, that can collect and exchange data over the Internet. The term IoT has come to represent any device that is now “connected” and accessible via a network connection (Huff Eckert et al., 2016).</td>
</tr>
<tr>
<td><strong>IBM Watson</strong></td>
<td>Referred to as a ‘supercomputer’, Watson’s underlying cognitive computing technology combines sophisticated analytical software and artificial intelligence to answer questions posed in natural language (IBM, 2018).</td>
</tr>
<tr>
<td><strong>Machine learning</strong></td>
<td>Machine learning is a field of computer science that gives computers the ability to learn without being explicitly programmed. This learning in turn enables them to improve their performance over time on specific tasks (Surden, 2014). Machine learning focuses on the development of programs that can teach themselves to learn, understand, reason, plan, and act (i.e., become more “intelligent”) when exposed to new data in the right quantities. Machine learning is a method of data analysis that automates analytical model building. Using algorithms that iteratively learn from data, machine learning allows computers to find hidden insights without being explicitly programmed where to look (SAS, 2018).</td>
</tr>
<tr>
<td>Terminology</td>
<td>Definitions &amp; Source</td>
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</tr>
<tr>
<td>Natural language processing</td>
<td>Natural Language Processing (NLP) is a field of artificial intelligence, computational linguistics and computer science that concerns the interactions between computers and human or “natural” languages. NLP involves computer programs that effectively process the large database of natural languages to understand human communication and intention, such as how to answer questions asked as if to a person (Manning &amp; Schütze, 1999).</td>
</tr>
<tr>
<td>(Artificial) Neural networks</td>
<td>Artificial neural networks (ANNs), a form of connectionism, are computing systems inspired by the biological neural networks that constitute animal brains. Such systems learn (progressively improve performance), to do tasks by considering examples, generally without task-specific programming. For example, in image recognition, they might learn to identify images that contain cats by analysing example images that have been manually labelled as “cat” or “no cat” and using the analytic results to identify cats in other images. They have found most use in applications difficult to express in a traditional computer algorithm using rule-based programming (Graupe, 2013).</td>
</tr>
<tr>
<td>Robots</td>
<td>Electro-mechanical machines or virtual agents that automate, augment or assist human activities, autonomously or according to set instructions — often a computer program (Huff Eckert et al., 2016).</td>
</tr>
<tr>
<td>Smart contracts</td>
<td>Computer scientist Nick Szabo first posited the idea of smart contracts in 1994, as ‘a computerized transaction protocol that executes the terms of a contract’ (Tapscott &amp; Tapscott, 2016). Smart contracts facilitate and permit trusted transactions and agreements to be carried out among anonymous, disparate parties without the need to have central authority, a legal system or external enforcement mechanisms. As computer protocols that facilitate, verify or enforce the negotiation or performance of a contract, they allow traceable, transparent and irreversible transactions. The code and agreements in smart contracts exist across a distributed, decentralized network called a blockchain.</td>
</tr>
<tr>
<td>Superintelligence</td>
<td>By a “superintelligence” we mean an intellect that is much smarter than the best human brains in practically every field, including scientific creativity, general wisdom and social skill. Superintelligence is currently hypothetical. If superintelligence occurred, it would see machines that are able to create new machines more intelligent than themselves, ad infinitum (Bostrum, 2014).</td>
</tr>
<tr>
<td>Third platform</td>
<td>The third platform is a term used by IDC to describe the four sets of interconnected technologies – mobility, big data analytics, cloud and social media - that also connect with AI (IDC, 2018).</td>
</tr>
<tr>
<td>Terminology</td>
<td>Definitions &amp; Source</td>
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</tr>
<tr>
<td>Turing test</td>
<td>Developed by Alan Turing in 1950 in his paper “Computing Machinery and Intelligence” (Turing, 1950), this is a test of a machine’s ability to exhibit intelligent behaviour equivalent to, or indistinguishable from that of a human. Turing proposed that a human evaluator would judge natural language conversations between a human and a machine designed to generate human-like responses. The evaluator would be aware that one of the two partners in conversation is a machine, and all participants would be separated from one another. The conversation would be limited to a text-only channel such as a computer keyboard and screen, so the result would not depend on the machine’s ability to render words as speech. If the evaluator cannot reliably tell the machine from the human, the machine is said to have passed the test. The test does not check the ability to give correct answers to questions, only how closely answers resemble those a human would give. Turing’s paper opens with the words: “I propose to consider the question, ‘Can machines think?’” Because “thinking” is difficult to define, Turing chooses to “replace the question by another, which is closely related to it and is expressed in relatively unambiguous words.” Turing’s new question is: “Are there imaginable digital computers which would do well in the imitation game?” This question, Turing believed, is one that can actually be answered. In the remainder of the paper, he argued against all the major objections to the proposition that “machines can think” (Turing, 1950).</td>
</tr>
</tbody>
</table>
Appendix C: References


Attorney-General v Quill Wills Ltd [1990] WASC 604


Barristers’ Board v Palm Management Pty Ltd [1984] WAR 101


*Cornell v Nagle* (1995) 2 VR 188


Legal Practice Board v Giraudo [2010] WASC 4

Legal Profession Practice Act 1958 (Vic)

Legal Profession Uniform Law Application Act 2014 (NSW)

Legal Profession Uniform Law Application Act 2014 (Vic)

Legal Profession Uniform Law, Schedule 1 of Legal Profession Uniform Law Application Act 2014 (Vic) and Legal Profession Uniform Law Application Act 2014 (NSW)

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