Croatian International Relations Review - CIRR
XXIV (81) 2018, 91-112
ISSN 1848-5782
UDC 347:65.011.56
DOI 10.2478/cirr-2018-0005

Legal Technology for Law Firms: Determining Roadmaps for Innovation[1]

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Abstract

The business model of many law firms, as legal professions on the whole, will be facing a considerable paradigm change since the work provided by law firms in the form of billable hours, in fact, largely consists of services which do not require superior legal education but involve mere data procession. It is only a question of time that the consequence – to have all outsourceable services be performed by means of legal technology – will become public knowledge in the branch, as the costs saved by the usage of legal technology are considerable. Legal technology, or Legal Tech, in this context represents a broad range of solutions that affect both lawyers and clients on various levels. However, the discourse on automatisation of law has been scant and sporadic. This paper aims to shed some light on the current operating technical solutions for innovation with the primary aim of explicating the different aims and levels of development of different legal technologies.

KEY WORDS:

automatization of legal professions, innovation, legal technology, law firms

1 This research was supported by the Estonian Research Council grant PUT1628 "The assessment of Estonian national e-government services system in the context of EU's legal framework of Digital Single Market", led by Professor Tanel Kerikmäe, Tallinn Law School, Tallinn University of Technology.

Introduction

In 2016, Linklaters and Pinsent Masons announced their decision to invest in autonomous office automatons, to be more specific, Linklaters has "developed Verifi, a computer program that can sift through 14 UK and European regulatory registers to check client names for banks. The company said it could process thousands of names overnight" (Financial Times 2016). Linklaters and Pinsent Masons are in good company: The latest BDO's Law Firm Leadership Survey (polling the managing partners and senior partners of 50 leading law firms) states that "artificial intelligence (AI) will have the greatest impact, with many believing it would replace the work of lawyers, or strip out a significant layer of work and revenue from law firms. This will in turn bring about changes to their resourcing mix, business models and financial structures at law firms" (BDO 2017).

'Artificial intelligence' as a term requires some specification in this context, as it is often used, especially in media and marketing, as a buzzword of changing content. Also, in the context of the latter reference it is questionable whether BDO's Law Firm Leadership Survey indeed intends to refer to AI in its technical meaning. In fact, as pointed out by Russell and Norvig (2010), from the perspective of computer science where AI is a subdivision of strong (human formed) and weak (non-human formed) AI, there are secondary "mimicking thinking and reasoning abilities, without actually having these abilities" (Ben-Ari et al. 2017). In the context of legal profession and legal automatons, and law and tech, any truly human-like acting mechanism is far from being available or even under imminent development, and we thus speak only of weak AI – and this also only in the three fields of machine learning, natural language processing and big data, as there is currently a paradigm change in terms of qualitative processing in this field. While Linklater's Verify may fall indeed into the category of big data, many other novel kinds of legal software in use right now or under development in the field of Legal Tech simply undertake computational tasks without any "intelligent" component at all.

This does not mean that these many innovative software tools do not essentially contribute to the comprehensive change of the legal service market, as technology is only one of three drivers (Susskind 2014) of this

change that will combine to transform the legal landscape radically and internationally. This paper thus does not focus only on the AI aspects of Legal Tech, but on all "disruptive technologies which do not support, sustain or enhance the way that lawyers and law firms have worked in the past" (Susskind 2014). These technologies, however, will fully unleash its comprehensive impact only in combination with two further aspects: One is the growing cost pressures on lawyers, or – in a nutshell – the "more for less challenge". The second evolves directly from the liberalisation of legal services and, in particular, from allowing non-lawyers to compete on the legal market.

These three aspects form at present quite an unclear amalgam of different and overlapping scenarios, to which this paper intends to shed some light.

Categorising of existing Legal Tech software solutions

Various authors have tried to categorise these developments; this paper presents and compares two of them prior to elucidating its proper perspectives on the issue.

Categorization according to Praduroux

Praduroux et al. (2016) propose eight categories in which legal technology presently advances:

1. Lawyer-to-Lawyer Networks, providing synergies for outsourcing and by the creation of social and referral networks;

2. Document Automation and Assembly (DIY Legal Forms and Contracts), which encompasses the design of systems and workflows that assist in the creation of electronic documents. These include logic-based systems that use segments of pre-existing text and/or data to assemble a new document and could also include the

so-called smart contracting: In transactions of the traditional type people are "bound" to do, to refrain from or to transfer things of value. In the networked society and in the digital age, transactions do not merely create a binding link but a complex bond or even several of these, some of which may refer to rights and duties. On a more practical account, the creation of rules nowadays need to focus on the protection of immaterial things of value, and control the actions of people and non-corporeal entities in an environment that is basically borderless (Solarte-Vasquez et al. 2016);

3. Practice Management (Case Management for Specific Practice Areas and Legal Billing). Practice and case management software provides attorneys with convenient methods for effectively managing client and case information, including contacts, calendar and meeting information, documents, and other specifics. All that is involved in facilitating automation in law practices can be considered practice/case management software;

4. Legal Research. Legal search engines based on advanced search technology from the fields of artificial intelligence, data mining, and natural language processing, with different characteristics and features are available;

5. Predictive Analytics and Litigation Data Mining. Predictive analytics is the analysis of data through statistical or mathematical techniques that results in meaningful relationships being identified in the data. These results can then be used for better prediction of future events and better decision-making. Predictive modelling of litigation management provides the information needed at the beginning of a juridical process to improve it;

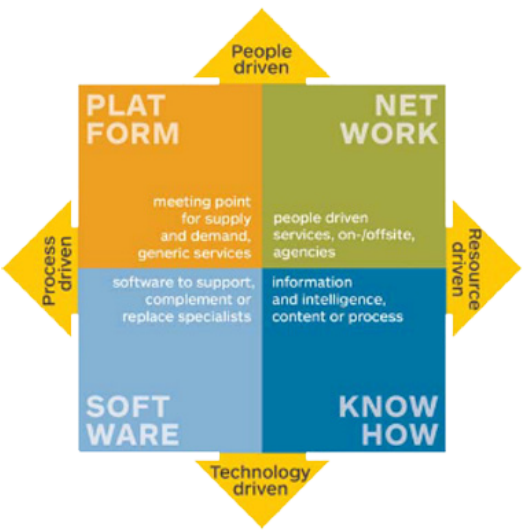
6. Electronic Discovery (also called e-discovery, eDiscovery or e-Discovery), which is the electronic aspect of identifying, collecting and producing electronically stored information (ESI) in response to a request for production in a law suit or investigation. ESI includes, but is not limited to, emails, documents, presentations, databases, voicemail, audio and video files, social media, and web sites – an aspect of eminent importance as the law mandates that all legal evidence need to be uncovered in law suits and the enormity of the task is staggering;

7. Online Dispute Resolution (ODR) uses technology, especially the Internet, to solve disputes out-of-court through an Alternative Dispute Resolution procedure. There are two basic branches of ODR, both based on different kinds of technology: The first branch may be called technology-based, referring to those systems where technology plays an active role in conducting the dispute resolution. A prominent example of technology-based ODR systems are blind-bidding systems. The technology uses multivariate algorithms to help parties arrive at the optimal outcome. The second branch of ODR consists of technology-assisted solutions referring to the use of technology to augment Alternative Dispute Resolution processes that exist independently of the technology;

8. Data Security Technologies. These are intended to protect confidentiality of data that is exchanged in client/server data transfers. Fundamental to these technologies is the use of proven, industry-standard encryption algorithms for data protection. (Praduroux et al. 2016)

Categorisation according to Rackwitz and Corveleyn

Rackwitz and Corveleyn, the founders of TPR Legal, drafted a "legal innovation matrix", in which Legal Tech can be distributed into four separate quadrants:



Source: Rackwitz and Corveleyn (2017)

These four quadrants refer to:

1. Platform: Access to legal services, i.e. IT tools serve as a platform, as for example provided by Neulexa, Lawkick, the Ask-a-Lawyer section of the Rocket Lawyer website, LegalZoom, and LawGives.

2. Network: Creating synergies by making use of networks, which differ from the platform solutions in a way that "network providers offer services themselves in the form of managed services (Thompson Reuters Legal Managed Services) or on-demand staffing (BLP Lawyers On Demand, Axiom Legal, Eversheds Agile, Obelisk Support). Network providers are ideal solutions for managing a sudden spike in work volume, meeting a requirement for specific expertise, or temporarily replacing a team member. The added value lies in their specialty in vetting, preparing, managing, and supporting temporary staff or managed teams. Network providers are ideal solutions for managing a sudden spike in work volume, meeting a requirement for specific expertise, or temporarily replacing a team member. The added value lies in their specialty in vetting, preparing, managing, and supporting temporary staff or managed teams." (Rackwitz and Corveleyn 2017)

3. Software: Providing software which directly performs legal tasks, i.e. content analysis, organization, search, or delivery, as for example Smartlaw, Tymetrix, Rocket Lawyer and LegalZoom, Flightright and New Street Solutions. Rackwitz and Corverleyn elucidate that "Software solutions within the legal services industry range from new ways to manage and analyse documents (LegalSifter) to analytics that use data to make legal judgements and predictions (Lex Machina, TyMetrix). Software providers can improve efficiency by facilitating and supporting time-consuming tasks like access to information, overview, collaboration, document processing, and document generation. Software providers include point solutions, offering a system for a single issue, and 360 degree solutions (LexisNexis, Wolters Kluwer, and SAP)" (Rackwitz and Corveleyn 2017); and finally

4. Know-How: Managing, creating, and delivering information, as for example provided by Bloomberg Law, Thompson Reuters Practical Law Company or Wolters Kluwer (and their recent acquisition of Smartlaw), who basically provide tools facilitating legal research for legal practitioners.

Comparison and practical significance

While Praduroux et al. (2016) apply a rather linear approach in their categorisation, Rackwitz and Corveleyn (2017) to a large degree include the findings of Praduroux in their matrix, making it more advanced also owing to its functional approach. As they point out in their research as well, the matrix focuses on alternative service providers rather than the lawyer's profession as such (who would serve tasks within all four quadrants). Within these categories, so far the branches of legal research, discovery, and document generation (respectively category 2, 4 and 6 in the Praduroux classification) have been proving most profitable for both alternative legal providers and traditional lawyers – led by legal research where machine automatisation started to play a role as early as in the mid-1960s, before for-profit companies like Lexis and Westlaw started establishing their practice in the 1970s (Terry 2008). In our days, "the application of machine intelligence to discovery resulted in global market revenue of $3.6 billion in 2010 ($1.1 billion in software and $2.5 billion in services), with growth to $9.9 billion anticipated by 2017 ($2.5 billion in software and $7.4 billion in services" (McGinnis and Pearce 2014). Rackwitz and Corveleyn also report an exponential growth of document generation as a Legal Tech target: "LegalZoom, Rocket Lawyer, Nolo, and Law Depot, among others, offer online consumer and small-business services using machine intelligence. Major financial players have entered the market with Permira and Kleiner Perkins owning an interest in LegalZoom and Rocket Lawyer raising funds from Google Ventures," resulting in the fact that already in 2011 more than "20 per cent of new California limited liability companies were formed using LegalZoom" (McGinnis and Pearce 2014).

The ethical dimension

The steady growth in online services is not only caused by economic interests of the providers of legal services. In the US, for instance, the National Center for State Courts published a paper outlining the need for state-by-state legal help portals that would not only provide information about legal issues but also guide a user through the entire process of determining their issue, choosing a path to take, and navigating this path to resolution. The article reports a 2010 study of the American Bar Association (ABA), which finds that an increasing number of people

are using online searches to find a lawyer for a personal legal matter. In particular, younger adults are especially likely to rely on online searches for finding a lawyer, while very few of those over 65 would use the Internet to find a lawyer (ABA 2010). Other studies were carried out in Canada, Australia and the United Kingdom. The Canadian group Community Legal Education Ontario (CLEO) surveyed legal service providers in Ontario to assess the services they provide to laypeople and the new initiatives they have promised. The Ontario legal services providers reported problems with online legal help and, in particular, that their clients are not able to easily find and make use of online information (CLEO 2013). In Australia, researchers in Queensland studied how technology is being used to deliver legal services in community legal centres. The outcome was a great potential of Internet-based services but the current models "are not sufficiently user-friendly or effective, in part because they are structured around lawyers' ways of addressing legal issues rather than the mental models of laypeople going through a problem" (QAILS 2014). Researchers at University College London (UCL) have conducted several studies on how technology-based legal help tools are used by laypeople in Great Britain. One study found significant growth in adults' use of the Internet to obtain information about problems with a legal dimension (Balmer at al. 2011). However, it also revealed some problems and in particular that young people had the most difficulty in finding useful and correct legal information. The UCL research team followed up with a study focused on young adults' use of the Internet to find legal help (Denvir et al. 2011).

This research shows that online legal services also serve clear non-profit legal purposes and serve society from a social aspect. Margaret Hagan from Stanford Law School and Stanford Institute of Design has categorised these needs as follows:

1. Government/Court-Sponsored Information sites that elucidate the law and respective legal procedures, and which explain eligibility for receiving services;

2. Non-profit Legal Services Referrals/Information sites that help a user to determine their personal legal issue is and what local services are available;

3. Private Legal Information sites that help users understand what the

law says about certain topics. These include sites that present articles and answers on legal issues, as well as more lawyer-focused tools that provide in-depth research tools and summaries;

4. Legal Services/Eligibility sites that present screeners to determine what legal service or paths users might be eligible to pursue. Often these are run by non-profit or start-ups; and

5. Private Legal Self-Help tools that not only provide the user with information but that also assist them in getting forms completed or even to settle their dispute without going through the courts at all. (Hagan 2016).

It can thus also be assumed that lawyers may face in this sense an ethical obligation to use low-cost or even free legal assistance software, as "clients will be able to more easily afford the legal representation that they need in other aspects of their lives" (Arruda 2017) if lawyers are able to maximize their time in providing more information and better service faster for their clients.

Problems of practical implementation

Already today computers are able to structure legal knowledge and regulate technologies in terms of clarifying the sources of legal norms and their hierarchical order; analyse lawyers' arguments from the angle of presented values and principles, and, using the big data method, analyse the textual interpretative methods and their applicability in practice; categorise the cases, 'hard cases', and pick up the elements from reasoning influenced by extra-legal elements; and finally, be "fact-determiners" when processing digital(ly) legal documents (Kerikmäe and Särav 2017).

Providing an example from Estonia – which pursues to improve juridical (e-)services and abandon the outdated modus vivendi – Indrek Teder, former Estonian Chancellor of Justice, introduced his start-up company

Avokaado, which enables the clients to create drafts of standard legal documents, such as contracts, online. He claims that the goal is to make regular forms more easily accessible and affordable (The Baltic Course 2016). Teder, who currently works as an attorney at law, believes that the field of traditional legal services is a late bloomer in terms of implementing innovation and stresses that "it is no longer acceptable to ask for a tailor-made price for standard solutions" and suggests that the area of legal services will change dramatically within the following years (*The Baltic Course* 2016).

The question is thus not whether to "allow" AI based software and digital innovation to enter into legal space, but rather how to determine the rights and duties of the stakeholders on the new type of playground.

Even though the potential and demand for automated lawyering is steadily growing, no real breakthrough – as it has occurred in sales (Amazon, eBay) or the social media – has taken place yet in practice. McGinnis and Pearce (2014) have identified three main reasons: "First, because machines will not speak in court for the foreseeable future, oral advocates will continue to enjoy a lucrative niche, although machines may reduce the number of disputes by creating a convergence of litigants on the value of a case. Second, those lawyers who are in highly specialised areas subject to rapid legal change, like Dodd-Frank regulation, will be relatively unaffected, because machines will work best in more routinized and settled areas. Third, counsellors who must persuade unwilling clients to do what is in their self-interest will also continue to have a role, since machines will be unable to create the necessary emotional bonds with clients." (McGinnis and Pearce 2014).

In a globalised world, the potential of uniform automatisation of law further depends on the geographical location (i.e. a specific legal system). To concede with King (2011), "laws vary substantially from one jurisdiction to the next, such that content or services may be legal in one jurisdiction and unlawful in another. This variation creates a tremendous demand for geolocation technologies that can accurately screen users by jurisdiction, so as to allow online vendors to do as much business as possible without breaking the law" (King 2011).

Reidenberg (2015) is rather blunt by adding that "technologically-created ambiguity challenges sovereign jurisdiction," and believes that the use of ICT-tools per se creates excessive tension between conservative justice and a lot more liberal digital world. Geographical location is problematic in segregated jurisdictions such as the European Union and the Digital Single Market, which the Union is struggling to effectuate in cooperation with the Member States. Still, the regulation of already existing or potential e-technologies and e-services in reasonable abstractedness may constitute a considerable challenge itself, but it will certainly require less effort in regard to efficiency of legal technology than considering 28 national legislative peculiarities.

Perspectives

Today we are faced with an abundance of "law practice software products" that are mutually applicable for their software[2], including streamline, clouding, built-in reminder and invoicing systems and calendars, but also those that administer certain legal areas.

Yet, the main discourse still concerns the controversial term AI – especially in terms of legal justification, promptness has remained similar to what Turing had in mind (thinking machine vs imitation of human mind, see Turing 1950). As pointed out above, even in its weak form, AI has sparked in legal fields only imminent practical relevance in the area of big data.

Big data

Big data usage is defined as a "generalized, imprecise term that refers to the use of large data sets in data science and predictive analytics. (…) First, it refers to technology that maximizes computational power and algorithmic accuracy. Second, it describes types of analyses that draw on a range of tools to clean and compare data. Third, it promotes the belief that large data sets generate results with greater truth, objectivity, and

2 See examples at http://www.capterra.com/law-practice-management-software/.

accuracy" (Crawford and Schultz 2014). In the context of strong AI, big data can help to overcome one of the most striking current shortcomings of AI – that immense dataset possessed by human intelligence which we simply call "common sense", i.e. knowledge about how data relate to each other. From a legal perspective, that aspect of "common sense" is so far of less relevance, as the merely quantitative gap between the amount of data which legal service software today proceed from and the virtually unlimited potential of big data represents already a sufficiently challenging task to be tackled by software. Amongst others, a well-known device serving these functions is IBM Watson[3], which analyses unstructured data and selects the most important information from documents by using natural language processing and machine learning. Nevertheless, IBM Watson has today several implementations outside of law area and it is used only as a form of augmented human intelligence[4] – it is not intended as an intellect system in the sense that it is meant to complement human activity through computer-human interaction whereas decision-making remains in the hands of humans, as a strong AI. One could draw a parallel here with how calculators initially worked in the hands of engineers and architecture professionals (Xia and Maes 2013). In law practice and legal science, machines like IBM Watson can contribute to faster and more effective (time-wise) research by grasping, collecting and analysing the data based on entered inquiries, although its intellect is limited to operating only upon commands.

Nevertheless, big data as such has a prominent impact on the legal profession from an entirely different perspective, as big data does not only provides for opportunities but, from a client's perspective, also far more risks in terms of data privacy and data leakages of litigation-sensitive data. As it is the lawyer's main task to professionally analyse and consecutively enforce and/or protect the client's interests, a "prudent attorney should advise against a client's needless dissemination of vast amounts personal information that could potentially be used by another to the client's detriment" (Segrist 2015) and thus comprehensively inform the client on the nature and risks of big data and advise him to take respective measures.

3 See the description and official website at https://www.ibm.com/watson/.

4 The conceptual framework for augmenting human intellect was initially introduced in the early 1960s by Engelbart (1962), where it was referred to as increasing the human intellectual capacity to approach and solve particular problems. See his original work *Augmenting Human Intellect: A Conceptual Framework* at http://www.dougengelbart.org/pubs/augment-3906.html/. Engelbart's work has been customized to contemporary human-computer interface by a joint work by scholars of Cambridge and MIT (Xia and Maes 2013).

Big data as a source itself is legally (and also technologically) less novel as it seems – as it has always been the case with access to data, handling these data appropriately when making legal decisions "involves an understanding of how they work, what inferences can be drawn and how these can legitimately feed into decisions and actions. It also involves transparency in order to enhance accountability, ensure accuracy and guard against illegitimacy" (Bennett 2014).

Natural Language Processing

As language is the lawyer's main course and main tool, the technological advancements in the field of natural language processing will have a deep impact on legal professions. However, beyond dictation technology – which already today replaces secretaries' tasks to a large degree – software is not sufficiently advanced yet to autonomously overtake legal writing. Still, once deep learning mechanisms will have reached a critical point of autonomy, there will be a comprehensive interplay with natural language processing skills as well, as both are closely related – "the difference between NLP and machine learning is the added value from interactions with human behavior, human language, and even human biases and other psychological traits" (Ben-Ari et al. 2017).

Deep learning

Finally, deep learning concerns a central field of legal work – development experience – by doing which results in continuing professionalisation. ROSS Intelligence[5], for instance, which has been built on IBM Watson's platform and works on a research basis, relies on direct inquiries in a question form, but provides immediate answers while at the same time being an independent learning system. Similarly to Watson, it is simply a supporting system, leaving the legal justifications to the command giver by default, but the system's proficiency exponentially increases by practice itself (and not by external updates, as usually practiced).

The central question is how far the core of legal work and lawyering – genuine legal reasoning – may be replaced by a machine like Watson

5 See more about the ROSS from its official website at http://www.rossintelligence.com/

as well in near future. Lippe and Katz do not think so, but "nevertheless, software systems, like the aforementioned ones, are potential reduction or exclusion means in the process of systematisation of legal order. Even though computers can be ridiculed in the sense of them ever replacing legal decision-makers, they can be rather successful in structuring the legal knowledge" (Lippe and Katz 2014). According to Lippe and Katz (2014), they could:

1. Explicate the sources of legal norms and their hierarchic order and find contradictions and overlaps;

2. Analyse lawyers' arguments from the viewpoint of presented values and principles by using the "big data" method and by that move closer to a solid and valid system of values;

3. Analyse the methods of textual interpretation and their applicability in practice;

4. Categorize cases, difficult cases and pick out elements from the arguments that were influenced by legally external facts; and

5. Be "the identifier of facts"[6] for processing the digital legal documents.

A comparison with lawyer's daily work shows that these tasks encompass the essence of legal work, which leaves the lawyers a question as to what their intrinsic function could still be after these tasks have been taken over by deep-learning enabled machines.

One aspect where a human mind will keep its supremacy for a long time is rooted in the general distinction between law as authority and law as legitimacy; the more sophisticated cases are to be decided, the less the concept of law as authority will be able to exclusively provide comprehensively convincing answers. When now "legal services are delivered by technological portals enabled by AI and legal solutions algorithms are proprietary, which version of law will prevail? It is easy enough to embed prescriptive codes of ethics into the parameters of such algorithms, but what of normative principles of transparency? When

6 A term used by Dewitz more than two decades ago, see Dewitz (1995).

legal thinking is increasingly hidden within inaccessible algorithms that drive seamless service delivery, is it sufficient to rely on the service provider to disclose the mechanisms by which decisions are being made? Or is it preferable to engage a human legal professional bound by rules and standards derived from normative ethical principles to work alongside the technology?" (Coulson 2017). These rhetorical questions succeed to draft an already quite defined field of needs for human legal reasoning – adjusting the outcomes in terms of transparency. For legal professionals, this perspective points out a growing need for specific expertise not only in "holistic" legal fields such as legal philosophy and comparative law[7] – a trend which could, also in legal education, shift the significance of these disciplines, taught today merely as adjacent courses (if at all), into the core fields of legal education.

Conclusion

For more than fifty years, automatisation of legal services has occupied a growing share of the tasks of legal professionals, resulting in today's situation in which especially discovery, legal search, generation of documents, creation of briefs and memoranda, and predictive analytics are, to a sufficient degree, technically performable by machines. Lawyers welcome these technologies for the cost-effectiveness (time, human resource), and the society appreciates new mechanisms as they help to avoid the extra-legal elements in the process of ensuring the rule of law (politics, ideologies) and – beyond that – also provide for a better predictability of legal decision (legal certainty) (Kerikmäe et al. 2017).

On the other hand, the century-long and still continuing success of the business models of traditional law firms (which keeps motivations for reform low), strictly hierarchic structures in these law firms (which are today usually led by non-digital natives) and the inherent interest to keep law and legal advice in a way opaque and obfuscated to gate-keep the monopoly on these services have till this date prevented reasonable adaptation to

7 Further on the need for reforming the teaching of comparative law, see Hoffmann 2014.

technological potentials. Besides, many lawyers intuitionally (and rightly) fear that computers may, at least partly, replace them and carefully accuse engineers for creating positivistic agents that are not capable of evaluating human values, ethics and the "living nature" of law (Kerikmäe and Särav 2017; Kerikmäe et al. 2016).

As excellent as these results may be, one has to agree with McGinnis and Pearce that "mixing in human intelligence may assure the best possible result. (…) Therefore, the disruptive effect of machine intelligence will trigger the end of lawyers' monopoly and provide a benefit to society and clients as legal services become more transparent and affordable to consumers, and access to justice thereby becomes more widely available" (McGinnis and Pearce 2014). This is a vision which, as much the society as such would profit, at first sight seems daunting to the practical legal profession. But also from a lawyers' point of view automatisation will lose much of its threatening aura if one realises that automatisation is – as all technological progress has been for all professions – less the end and rather a transition to new forms of work and new kinds of tasks to which adaptation will always be possible to those who seriously pursue it. The categorisation of legal technologies should become a relevant factor not only in the context of lawyer-client relationship (clarity of benefits and risks), but also for legal professionals among themselves, as different digital options described in this article have distinct capacities and aims. Finally, one should be careful to market every digital solution as Artificial Intelligence; a clear categorisation and division of the technologies used would bring clarity in Legal Tech, which to many still seems as a mystified parallel world which threatens to swallow the traditional set-up of lawyers' services. This would reduce the ambiguity and confusion that is understandable in the situations where innovation does not (yet) have firm frames.

Bibliography

American Bar Association, 2011. American Bar Association standing committee on the delivery of legal services, perspectives on finding personal legal services: The results of a public opinion poll, [online]. Available at: https://www.americanbar.org/content/dam/aba/administrative/delivery_legal_services/20110228_aba_harris_survey_report.authcheckdam.pdf [Accessed 30 February 2018].

Arruda, A., 2017. An Ethical Obligation to Use Artificial Intelligence: An Examination of the Use of Artificial Intelligence in Law and the Model Rules of Professional Responsibility. *American Journal of Trial Advocacy*, 40(3): 443–458.

Balmer N. J., Buck, A., Patel, A., Deniver, C. and Pleasence, P., 2010. *Knowledge, capability and the experience of rights problems*. Legal Services Research Centre, Research report March 2010, [online]. Available at: http://lawforlife.org.uk/wp-content/uploads/2010/05/knowledge-capability-and-the-experience-of-rights-problems-lsrc-may-2010-255.pdf [Accessed 30 February 2018].

BDO, 2017. Technology set to have the greatest impact on law firms over the next five years. BDO's Law Firm Leadership Survey, 16 May 2017, [online]. Available at: http://www.bdo.gg/en-gb/news/2017/technology-set-to-have-the-greatest-impact-on-law [Accessed 30 February 2018].

Ben-Ari, D., Frish, Y., Lazovski, A., Eldan, U. and Greenbaum, D., 2017. Artificial Intelligence in the practice of law: an analysis and proof of concept experiment. *Richmond Journal of Law & Technology*, 23(2): 2–55.

Bennett Moses, L. and Chan, J., 2014. Using big data for legal and law enforcement decisions: testing the new tools. *University of New South Wales Law Journal*, 37(2): 643–678.

CLEO, 2013. Public legal education and information in Ontario communities, formats and delivery channels, 22 [online]. Cleo

Centre for Research and Innovation. Available at: https://www.cleo.on.ca/en [Accessed 30 February 2018].

Coulson, S., 2017. Normative ethics and the changing face of legal technology: or how to stay relevant in a transformed profession. *The Advocate*, 76, Part 1.

Crawford, K. and Schultz, J., 2014. Big data and due process: toward a framework to redress predictive privacy harms. *Boston College Law Review*, 55(1): 93–128.

Dewitz, S., 1995. Using Information Technology as a Determiner of Legal Acts. In: Bukowski, Z., White, I. and Hahn, U., eds. *Informatics and the Foundations of Legal Reasoning*. Dordrecht: Springer. pp. 357–369.

Engelbart, D. C., 1962. *Augmenting Human Intellect: A Conceptual Framework*. Menlo Park: Stanford Research Institute.

Financial Times, 2016. Legal firms unleash office automatons. 16 May, [online]. Available at: https://www.ft.com/content/19807d3e-1765-11e6-9d98-00386a18e39d [Accessed 30 February 2018].

Hagan, M., 2016. The user experience of the Internet as a legal help service: defining standards for the next generation of user-friendly online legal services. *Virginia Journal of Law and Technology*, 20(394): 411–417.

Hoffmann, T., 2014. Reflections on opportunities for comparative private law in academia: Central and Eastern Europe. *Review of Central and East European Law*, 39(2): 191−209.

Kerikmäe, T., Hamulak, O., Chochia, A., 2016. A Historical Study of Contemporary Human Rights: Deviation or Extinction? Acta Baltica Historiae et Philosophiae Scientiarum, 4 (2): 98−115.

Kerikmäe, T., Müürsepp, P., Särav, S. and Chochia, A., 2017. Ethical Lawyer or Moral Computer – Historical and Contemporary Discourse on Incredulity between the Human and a Machine. *Вісник Національної академії правових наук України*, 2(89): 27−42.

Kerikmäe, T. and Särav, S., 2017. Paradigms for Automatization of Logic and Legal Reasoning. In: Krimphove, D. and Lentner, G. M., eds. *Law and Logic: Contemporary Issues*. Duncker & Humblot. pp. 205−222.

King, K. F., 2011. Personal jurisdiction, Internet commerce, and privacy: the pervasive legal consequences of modern geolocation technologies. *Albany Law Journal of Science and Technology*, 21: 61–124.

Lippe, P. and Katz, D. M., 2014. 10 predictions about how IBM's Watson will impact the legal profession. *ABA Journal*, [online]. Available at: http://www.abajournal.com/legalrebels/article/10_predictions_about_how_ibms_watson_will_impact/ [Accessed 30 February 2018]

McGinnis, J. O. and Pearce, R. G., 2014. The great disruption: how machine intelligence will transform the role of lawyers in the delivery of legal services, *Fordham Law Review*, 82: 3041–3066.

Nadkarni, P. M., Ohno-Machado, L. and Chapman, W. W., 2011. Natural Language Processing: an introduction. *Journal of the American Medical Informatics Association*, 18(5): 544–551, [online]. Available at: https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3168328/ [Accessed 30 February 2018].

Praduroux, S., de Paiva, V. and di Caro, L., 2016. *Legal Tech Start-ups: State of the Art and Trends*, [online]. University of Turin, Italy. Available at: http://vcvpaiva.github.io/includes/pubs/2016-legal.pdf [Accessed 30 February 2018].

QAILS, 2014. Queensland community legal centres' use of technology. Literature Review and Discussion Paper, [online]. Queensland Association of Independent Legal Services Inc. Available at: https://law.uq.edu.au/files/1260/Qld-CLCs-and-technology-August-2014.pdf [Accessed 29 January 2018].

Rackwitz, F. and Corveleyn, F., 2017. *Navigating the Market for Alternative Legal Providers: How to Choose a Right Fit Provider*, [online]. CEB Leadership Council for Legal Executives White Paper, p. 6. Available at: https://tpr-legal.com/wp-content/uploads/2017/04/Navigating-the-Market-for-Alternative-Legal-Providers_-How-to-Choose-a-Right-Fit-Provider-CEB-Leadership-Council-for-Legal-Executives.pdf [Accessed 30 February 2018].

Reidenberg, J. R., 2015. Technology and Internet jurisdiction. *University of Pennsylvania Law Review*, 153: 1951–1974.

Russell, S. J. and Norvig, P., 2010. *Artificial Intelligence: A Modern Approach*. 3rd edition. Upper Saddle River: Prentice Hall.

Segrist, P., 2015. How the rise of big data and predictive analytics are changing the attorney's duty of competence. *North Carolina Journal of Law & Technology*, 16(3), [online]. Available at: http://scholarship.law.unc.edu/cgi/viewcontent.cgi?article=1285&context=ncjolt [Accessed 30 February 2018].

Solarte-Vasquez, M. C., Järv, N. and Nyman-Metcalf, K., 2016. Usability factors in transactional design and smart contracting. In: Kerikmäe, T. and Rull, A., eds. *The Future of Law and eTechnologies*. Dordrecht: Springer. pp. 149−176.

Susskind, R., 2013. *Tomorrow's Lawyers: An Introduction to Your Future*. Oxford: Oxford University Press.

Terry, L., 2008. The legal world is flat: globalization and its effect on lawyers practicing in non-global law firms. *Northwestern Journal of International Law & Business*, 28: 527–566.

The Baltic Course, 2016. Former Estonian Chancellor of Justice established Law Firm Teder, [online]. Available at: http://www.baltic-course.com/eng/markets_and_companies/?doc=115102 [Accessed 30 February 2018].

Turing, A., 1950. Computing machinery and intelligence. *Mind*, 59(236): 433–460.

Vogl, R., 2016. SLS Blog: The Coming Age of Legal Technology, [online]. Available at: https://law.stanford.edu/2016/09/26/184188/ [Accessed 30 February 2018].

Xia, C. and Maes, P., 2013. The Design of Artifacts for Augmenting Intellect. In: *Proceedings of the 4th Augmented Human International Conference (AH'13)*. Association for Computer Machinery. pp. 154–161.

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