



Vaasan yliopisto
UNIVERSITY OF VAASA

OSUVA Open
Science

This is a self-archived – parallel published version of this article in the publication archive of the University of Vaasa. It might differ from the original.

Digital technologies, legal design and the future of the legal profession

Author(s): Corrales, Marcelo; Fenwick, Mark; Haapio, Helena

Title: Digital technologies, legal design and the future of the legal profession

Year: 2019

Version: Accepted manuscript

Copyright ©2019 Springer Nature Singapore Pte Ltd.

Please cite the original version:

Corrales, M., Fenwick, M., & Haapio, H., (2019). Digital technologies, legal design and the future of the legal profession. In: Corrales, M., Fenwick, M., & Haapio H., (eds), *Legal Tech, Smart Contracts and Blockchain. Perspectives in Law, Business and Innovation* (pp. 1–15). Springer, Singapore. https://doi.org/10.1007/978-981-13-6086-2_1

Digital Technologies, “Legal Design” & the Future of the Legal Profession

Marcelo Corrales, Mark Fenwick and Helena Haapio

Abstract Legal Technology – or “Legal Tech” – is disrupting the traditional operations and self-understanding of the legal profession. This chapter introduces the central claim of this book, namely that these developments are having and will continue to have a disruptive effect on the work of lawyers and that adapting to this new operating environment is crucial for legal professionals remaining relevant in an increasingly technology-driven world. This introductory chapter outlines some of the main features of this on-going transformation process, introduces some of the pressures it is creating for lawyers, and provides short summaries of the chapters that comprise this collection.

Keywords Legal Tech, Blockchain, Smart Contracts, Cryptocurrency, Legal Design, Legal Profession

1 Introduction

Legal Technology, also known as “Legal Tech,”¹ is a term that broadly refers to the adoption of innovative technology and software to streamline and enhance legal services. Legal Tech companies are generally startups founded with the specific purpose of disrupting the operation of the (traditionally conservative) legal profession.²

Three stream categories can be distinguished within Legal Tech: i) technologies facilitating the access to and processing of data; ii) support solutions; and, iii) substantive law solutions.³

The first stream is the most general and consists of “enabler technologies” – such as Cloud storage tools and cybersecurity solutions – that would facilitate access to lawyers and legal data (i.e., information retrieval). This category attempts to support the competitiveness of the legal market and legal research.⁴

The second stream comprises “support-process” tools to adopt more effective case management and “back-office” systems in order to maximize the potential of the law firm’s administration.⁵ These processes vary from the management of human resources and customer relationships to other functions largely related to the performance of accounting, billing, payrolls and other administrative tasks.⁶

The third stream adopts solutions which assist or even replace legal advice from lawyers in the execution of specific legal tasks. This category takes a broader view and includes

¹ Other synonyms which are used interchangeably are “law tech,” “LegalIT,” “legal informatics.”

² Bues and Matthaai (2017), p. 90.

³ Bues and Matthaai (2017), p. 90.

⁴ Bues and Matthaai (2017), p. 90.

⁵ Bues and Matthaai (2017), p. 90.

⁶ The Boston Consulting Group and Bucerius Law School (????), p. 5.

various subfields such as automated contracts, e-discovery, online dispute resolution, legal analytics, Blockchain-based technologies and, in particular, Smart Contracts.⁷

The content of this book focuses primarily on the third category and how lawyers could tap into the potential power of these developments. This chapter introduces the main aspects of Blockchain technology, Smart Contracts, and how legal design functions as a powerful interface tool that can empower individuals to make the “best choice” for them in a given situation. Section 2 outlines in simple terms how Blockchain and Smart Contracts work and suggests that they have the potential to revolutionize multiple aspects of social and economic life. Section 3 introduces how and why developments in the context of Legal Tech place a new emphasis on what we would call “legal design.” Section 4 suggests that these developments will continue to have a disruptive effect on the legal profession and that adapting to this new operating environment is crucial in order for lawyers to remain relevant in a technology-driven world. Finally, Section 5 briefly summarizes each of the chapters and identifies key themes.

2 Blockchain & Smart Contracts

The Blockchain is a decentralized and distributed cryptographic digital “ledger” that is used to record transactions. The principles underlying this technology allows people who do not know or trust each other to build a large digital record of “who owns what” that will enforce the consent of everyone concerned.⁸

The Blockchain “acts as a consistent transaction history on which all ‘nodes’ eventually agree.”⁹ It is essentially a public database with the potential to store and transfer tangible assets (physical properties such as cars, real estate property, etc.) and intangible assets (such as votes, genomic data, reputation, intention, information, software and even ideas).¹⁰

The Blockchain is also a verification system that enables – *among other things* – cryptocurrencies such as Bitcoin, Ethereum, Ripple, etc. For this reason, distributed ledgers in the form of Blockchain promise to be a technology that will revolutionize the business world and virtually every aspect of record-keeping or exchange that we currently have.¹¹ This technology enables not only crypto-currencies but also different kinds of applications, platforms, information storage and distribution systems.¹² At a governmental level, the Blockchain could be used to leverage the monitoring and controlling of certain tasks such as voting systems, tax collection, issuing passports, record land registries, delivering grants and other benefits.¹³

In other words, the Blockchain allows parties to send, receive and store value or information through a distributed peer-to-peer network of several computers. Each transaction is distributed across the entire network and is recorded on a “block” only when the rest of the network ratifies the validity of the transaction based on past transactions considering the previous blocks.¹⁴ Each block follows the other one successively and this is what creates the Blockchain.¹⁵

⁷ Bues and Matthaeci (2017), p. 90.

⁸ The Economist (2015a).

⁹ Wattenhofer (2016) p. 85.

¹⁰ Swan (2015), p. 16.

¹¹ Walch (2018), p. 245.

¹² Tomas (2017), Introduction.

¹³ Asharaf and Adarsh (2017), p. 33.

¹⁴ Kost de Sevres (2016).

¹⁵ Mougayar (2015).

To put it in simple terms, the technology behind the Blockchain could be compared to that of a database, although the way of interaction is different in a sense that it is maintained and updated by a network of participating computers rather than a single computer of a company or organization.¹⁶ For this very reason, the Blockchain can be regarded as an authoritative public database with a very high level of trust.¹⁷

Using a clear analogy from everyday life, it would be like when you try to erase an old message in a group conversation on WhatsApp in order to hide certain information. This could not be done in the Blockchain, since it contains the complete history of all transactions that have been made in the network.

As such, the Blockchain creates more transparency and allows otherwise mutually distrustful parties to contract safely without intermediaries.¹⁸ This is because the pervasive nature of the Internet allows that the node of a Blockchain can be supported outside of the organization by a neutral third party.¹⁹ Therefore, it is fair to say that the Blockchain itself becomes the trusted (distributed) third party. This also enables the Blockchain to act as mediator in conflict situations.²⁰

In the same way that the Internet decentralized the information, what the Blockchain is essentially trying to achieve is to decentralize the certification processes by acting as a database that holds records of every transaction executed in the network.²¹ That is, decentralizing the “trust” that is usually deposited in intermediary institutions (banks, credit card companies, governments, etc.) and transferring it directly to the network of individuals that are part of the Blockchain.²²

If we take Bitcoin as an example, the “coins” themselves are not physical assets, not even digital files, but entries in a public ledger using its own unit of account. Therefore, owning a Bitcoin is more like a declaration of owning something, which is recorded on the Blockchain.²³ Satoshi Nakamoto (a pseudonym that refers to a person or a group of people) is credited for mining the first block of the Bitcoin back in 2008.²⁴ Bitcoin was created as a cryptocurrency to prevent “double spending,” acting as a decentralized public ledger for all transactions made on the Bitcoin network. The first Blockchain was therefore an essential feature of Bitcoin and this is the reason why the Blockchain is widely associated with Bitcoin.²⁵

Take for instance a bank transaction. Imagine that a person called Anna would like to send money to another person called Bob. The normal procedure is to wire the money through a bank which is acting as an intermediary. In this case, Anna would ask her bank to transfer the money to Bob. The transaction may take a few minutes or several days, depending on the amount, the bank and the country in which the transfer is made. The transaction does not really need a transfer of bank notes, but the intermediary banks would rather make a simple change in the balance of their accounts with the use of a computer software. The problem here is that neither Anna nor Bob have any control over the process, since only the banks have all the information. Both depend entirely on those banks (and their commissions) to carry out the transaction.

¹⁶ Mougayar (2015).

¹⁷ Stark (2016).

¹⁸ Kosba et al. (2015), p. 1.

¹⁹ Linthicum (2016).

²⁰ Wattenhofer (2016), p. 88.

²¹ Morabito (2017), p. 167; Drescher (2017), p. 5.

²² Huang (2015), p. 3.

²³ The Economist (2015b).

²⁴ Bues and Matthaiei (2017), p. 90.

²⁵ Prusty (2017), p. 14; Williams, (2017), p. 44.

What the Blockchain basically proposes is to eliminate intermediaries and decentralize the entire management system, providing a high level of security and integrity by acting as a database that contains records of each transaction executed on the network. The control of the process would rely directly on the users, not on the banks anymore as in the previous example. In this case, both Anna and Bob would become participants and managers of the bank account books. This example can be extrapolated to other types of transactions and not only to money transfers. This is why the Blockchain represents a profound paradigm shift in the entire financial structure that we currently use.

Cryptocurrencies based on decentralized Blockchains, such as the abovementioned examples, have allowed the emergence of the so-called: “Smart Contracts.”²⁶ According to Kost De Sevres, Smart Contracts are “self-executing, autonomous computer protocols that facilitate, execute and enforce commercial agreements between two or more parties.”²⁷ Another definition of Smart Contracts that focuses on Blockchain technologies is given by Wattenhofer as “an agreement between two or more parties, encoded in such a way that the correct execution is guaranteed by the Blockchain.”²⁸

The idea of Smart Contracts was popularized by computer scientist Nick Szabo in 1997. He suggested that many kinds of contracts can be embedded in computer software and hardware architecture. A typical example of a Smart Contract in its earliest and most simple form is the vending machine, which is designed to transfer the ownership of a good (e.g., a can of soda) for the exchange of money. The vending machine is in control of the property – by being physically sealed – thus can enforce the “contract” that is called a “contract with bearer,”²⁹ since anyone with money can engage in a transaction with the vendor.³⁰

By extending the logic underlying mechanical devices such as the vending machine, Szabo suggested that the computer code could be used in place of vending machines. This idea could be implemented to negotiate more complex transactions, forging strategic relationships, and coordinating transactions arising under diverse jurisdictions. Instead of transferring the ownership of a can of soda, a Smart Contract could transfer ownership of shares, real estate, intellectual property rights, etc.³¹

Among the most important advantages of the Blockchain and Smart Contracts are the reduced transaction costs originating from intermediary third parties. In the same way, the Blockchain accelerates the transactions because it works 24 hours a day, 7 days a week. Imagine how long it takes to transfer money to another country using a bank as an intermediary. In short, with Blockchain, time and transaction costs could be reduced to a minimum, which would, in turn, translate into greater efficiency when doing business in the long term.

However, since the Blockchain is a relatively new and disruptive technology, its current implementation remains difficult. It takes time to get the specialized personnel to implement it within the structure of the systems of governments and companies. This process of adaptation can take several years and is one of the main objectives of this book. To reduce the information gap and sparkle new research on Blockchain-based technologies.

Another fundamental problem is that of anonymity, especially with regard to the use of cryptocurrencies. As some of the cryptocurrencies offer special characteristics of anonymity, they could facilitate certain criminal activities such as: money laundering, sale of drugs online, etc. This leads to the raising of some legal issues not yet contemplated in our legal

²⁶ Weber et al. (2016), p. 330.

²⁷ Kost de Sevres (2016).

²⁸ Wattenhofer (2016), p. 88.

²⁹ Szabo (1997a).

³⁰ Szabo (1997b).

³¹ Stark (2016).

system. It could be said that, there is a kind of “status quo” in this respect; and the lack of regulation generates at the same time a stagnation in the development and evolution of this technology.

Understanding and navigating the new environment created by the above technologies clearly requires a high degree of technical competency, as multiple technologies need to be gathered together and integrated into products and services relevant in a legal context. But, there is also a design challenge created by these disruptive innovations. In this context “design” focuses on understanding an area of human experience and then developing a product or service that utilizes technology to improve that experience and empower people in new and previously unimagined ways. The next section considers the design issues that new technologies are creating in a legal context, focusing on the key issue of legal design.

3 The Legal Design of (Smart) Contracts

Legal Design is an umbrella term for merging forward-looking legal thinking with design thinking. It takes an interdisciplinary and proactive approach to contracts and law, covering not only legal information and documents, but also legal services, processes, and systems.³²

In the context of contracts, the focus is on supporting collaboration, driving desirable outcomes, creating opportunities, and preventing problems before they arise. This requires contracts and processes that make sense for business and the people who work with those contracts. Their needs are not being served well by contracts’ current design (or lack of design), whether those contracts are smart or “dumb.”³³

As Tim Cummins, the then CEO of the International Association for Contract and Commercial Management (IACCM) put it: “Impenetrable, incomprehensible, confusing and downright boring. These are a few of the words commonly associated with contracts. Whether it is the way they are designed, or the way they are worded, the overwhelming majority of contracts merit those descriptions.”³⁴ The look and feel of Smart Contracts is not likely to improve the situation for human readers. Even if Smart Contracts offer perfect performance, humans will remain in the picture for the foreseeable future.

Legal Design is about applying human-centered design to prevent or solve legal problems. It prioritizes the point of view of the “users” of the law – not only lawyers and judges, but also citizens, consumers, and businesses.³⁵ The approach is particularly important in the context of Legal Tech and Smart Contracts, where the choices the builders and users make can have a huge impact on both the processes and systems as well as their outputs. Legal designers can bring a new perspective to Smart Contract planning and making by asking questions such as:

- i. How can we make “good” Smart Contracts?
- ii. How can we build user-friendly systems, interfaces, and editors that facilitate the making of “good” Smart Contracts – and what does “good” mean here?
- iii. How can we make sure Smart Contracts capture the intent of their parties?
- iv. How can we secure successful implementation of Legal Tech and transformation from “dumb” to Smart Contracts?

³² For Proactive Law and Proactive Contracting, see Siedel and Haapio (2011) and Haapio (2006). For Legal Design, see Hagan (n.d.) and “What is Legal Design?” at LeDA/Legal Design Alliance (n.d.).

³³ For “dumb” contracts, see Lipshaw (2018).

³⁴ Cummins (2016).

³⁵ LeDA/Legal Design Alliance (n.d.).

- v. How can we build powerful interface tools that empower individuals to make the best choice for them at the Smart Contract planning and making stage?

Where people are needed to initiate a contract or to translate some obligations of the contract into action, they need to be aware of their roles and responsibilities, and what they need to do when. This requires interfaces that are easy to use and information that is easy to understand. How best to do all of these things, is a question deeply rooted in the discipline of information design.³⁶ Legal information design is about organizing and displaying information in a way that maximizes its clarity and understandability. It focuses on the needs of the users who may need to grasp both the big picture and the details and switch between these two views. Even in the era of Smart Contracts, the need remains to create contracts and guidance that users can understand and put into practice.

Legal Design stresses the importance of visual communication. Visualizing helps humans to think, communicate, make assumptions visible, and secure understanding across disciplines. The goal is not to create images – the goal is to create understanding. In the context of Smart Contracts, visualization can help create functional, useful, and usable processes, systems, and outcomes. It can help lawyers, technologists, and business people see the big picture and communicate and share solutions.

No law requires contracts to look and feel like legal documents, and they do not have to be text-only. Visualization – here understood as adding graphs, icons, tables, charts and images to supplement text – can help human readers in navigating contract text, opening up its meaning, and reinforcing its message. At the contract planning stage visualization can help identify the parties’ goals and expectations, align these, and capture them in a record.

Different jurisdictions have different requirements for valid contracts, but by and large, the freedom of contract allows the parties to choose whether, when and to whom they want to commit themselves through a contract. The parties are not only free to choose and agree upon the contents of their contract, they are also free to choose its form (except when the law requires a special form, such as in the case of sale of real property). As long as the arrangement and the parties’ intent to commit (or not to commit, as the case may be at the preliminary stages) are clear, the parties have a freedom to tailor their affairs and to design their contracts the way they want, according to their own needs and interests. If they want to, they can choose to deviate from the traditional paradigm in which the contents of contracts are expressed as text only.³⁷ They can choose to use code, a visual user-friendly interface, or both for their contracts – something that is already happening with the Creative Commons licenses, for example.³⁸

What, then, is the true purpose of contracts? We are likely to obtain different answers from different people. Even lawyers may not agree among themselves. For some, winning possible future disputes and litigation is key, for others preventing these is what matters. If we take the view that contracts exist because of business deals and relationships, contracts become business tools rather than merely legal tools, and the role of contract lawyers changes: “like engineers, [they] want to make something useful that works for their clients.”³⁹ Contracts themselves can be viewed as interfaces,⁴⁰ and information design methods and strategies can be used to simplify them.⁴¹ Legal Design can help change mindsets, too, so the move toward a new paradigm – we call it Next Generation Contracts – can begin.

³⁶ Haapio and Passera (in press).

³⁷ Haapio (2013), p. 79.

³⁸ See “Three “Layers” of Licenses” at Creative Commons (n.d.).

³⁹ Howarth (2013), p. 67.

⁴⁰ Haapio and Passera (in press).

⁴¹ Waller et al. (2017).

With the help of Legal Design, we can supplement text or code with layers of explanatory diagrams, examples, plain language translations, audio, or video. Merging Legal Tech with Legal Design helps switch between the different versions of the same content and facilitates the making of “good” contracts, whether smart or otherwise. With the help of code, we can also build better human-contract interfaces and arrive at “wise contracts”⁴² – Smart Contracts that work for people and machines: contracts that are simple at the front, but smart – from a legal and technological perspective – at the back.

From This To This
Legally perfect contracts that prepare for failure and seek to allocate all risk to the other party.	Usable contracts that facilitate and guide desired action and help implement what is agreed.
Contracts are legal tools, made to win in court: legally binding, enforceable, must cover all conceivable contingencies.	Contracts are business tools: must be clear and easy-to-use to achieve business goals for a win-win deal.
Contracts allocate risk . They are needed only when things go wrong.	Contracts add value . They enable business success and prevent problems and disputes.
Contracts are text-only .	Contracts can be presented as text, code, visuals, audio, video, or hybrids , depending on the needs of the audience.

*Table 1: Moving to Next Generation Contracts.*⁴³

4 The Future of the Legal Profession?

In general, the image of lawyers as innovators or constructive partners in innovation is not positive. Entrepreneur and venture capitalist, Steve Blank, leaves little room for doubt when

⁴² Hazard and Haapio (2017).

⁴³ Adapted from Haapio (2013), p. 41-42 and Waller et al. (2017).

he claims that lawyers have always been poor at running innovative companies and that they often hold back such companies.⁴⁴ The traditional issues with lawyers are well-known: they are constantly “over-lawyering” and killing innovation; they are notorious for failing to prioritize issues, instead focusing on what are – from a business point of view – trivialities or irrelevancies; they have poor listening skills; they are inflexible and unresponsive.

These problems become even worse in the context of digital technologies. For a start, lawyers tend to zoom in on the “privacy” and “data protection” issues raised by new technologies, such as artificial intelligence or blockchain. Or, they will explain how current rules don’t allow for the use of “Big Data.” They even argue that we need stricter rules and regulations to deal with IP infringements, for instance. In short, lawyers are constantly holding back innovation, rather than facilitating it. Lawyers are creating problems, rather than working to find solutions.

The traditional approach of lawyers is clearly wrong and short-sighted. Lawyers need to be much smarter about new technologies and their role in building a better future. This is not only necessary to remain relevant in a fast-changing digital world, but also to contribute to a better society for all.

So, what should lawyers be doing? In short, adapting and taking advantage of new opportunities. Here are three things that lawyers could be doing in order to add value. First, lawyers need to work with new technologies. Existing and new clients have to prepare for a new digital and innovation-driven economy. They want to get a better idea of how their businesses can benefit from Blockchain, Smart Contracts and algorithms. Such clients will expect their lawyers to understand these technologies in order to provide strategic business and legal advice. If lawyers are not able to give a satisfying answer to their clients, they run the risk that their clients will switch to another law firm or consultant. Being tech-savvy will be essential in building and maintaining “brand” loyalty.

Second, lawyers need to come up with “smart” solutions. We believe that digital technology has the potential to contribute to a better, healthier and safer world. Yet, there are challenges that we shouldn’t ignore. We need to be smart about digital technologies. In order to come up with the best possible solutions, lawyers (and other consultants) need to have a detailed and accurate understanding of the new technologies in order to play a role in identifying such solutions.

Third, lawyers must learn to work together with “technologists.” We strongly believe that pro-active and tech-savvy lawyers can play a crucial role in the further development of the digital economy. This doesn’t mean passively “applying” current rules and regulations to a new technology in order to constrain innovation. This is the type of lawyer that Steve Blank objects to. Rather, it requires new and different skills. The “best” lawyers of the future will be those that understand the need to work together with technologists in order to find technological solutions that can help generate confidence in the technology, *as well as* meeting the regulatory requirements.

This means going beyond a pure compliance role and instead focuses on adding-genuine value by utilizing current technological developments. For instance, how can we create a system in which autonomous and connected devices can build reputation and trust, and ensure that the collected data will only be shared with other trusted devices. Such an approach addresses privacy and data protection concerns, but also makes a product more attractive in today’s marketplace.

⁴⁴ <https://thinkgrowth.org/why-lawyers-dont-run-startups-25c5e0c877ed>

5 Chapters

Each of the chapters collected here address different aspects of the above themes and issues.

The first chapter, by Rory Unsworth, focuses in more detail on what the widespread use of “self-executing” contracts means for the future of contracting. For certain standard contract types with simple and well understood provisions, little geographical variation, no intermediation and short execution periods, change is already occurring without great difficulties. However, in the case of more complex, more entrenched, and less agile sectors of the global economy, there are multiple hurdles to overcome and more time will be needed for implementation. The arrival of this new technology presents important questions about the future of contracting, as well as about traditional legal practice within both legal departments and law firms, calling for new forms of cooperation between business and their lawyers. Given that the natural reaction to change is resistance, that companies are having ever-greater challenges navigating international regulation and that as a result legal department within companies tend to exert a strong influence out of line with the number of employees they include, the power of institutional resistance to delay adoption of the change will be considerable. To achieve these objectives, the chapter stresses the importance of a well thought through Digital Contract Optimization plan, supported by new technologies, as a means to mitigate the various risks associated with smart contracting.

Thomas D. Barton, Helena Haapio, Stefania Passera, and James G. Hazard also focus on contracting in commercial settings. They introduce one of the central problems with traditional contracts, namely that they are “documents written by lawyers, for lawyers,” artifacts of a negotiated exchange wrapped tightly in pages of clauses intended to insulate the agreement against litigation attacks. Such verbose language and structure come at high costs, namely such contracts decrease accessibility, functionality, and efficiency. Reforms to the classic forms and mentality surrounding contracting have recently been proposed, several of which look to insights and methods outside the legal system. This chapter outlines two such recent efforts: information design and computer codification. Such methods can enhance communication, participation, and usefulness across the entire life-cycle of contracting: assessment of needs, gathering background resources, negotiation, commitment, implementation/monitoring, adjustment, and sometimes dispute resolution. Although challenging to integrate, better design and codification can re-conceptualize contracting in order to generate value and better manage business enterprises.

Margaret Hagan presents new models for the presentation of contracting terms and interactions, based on user research and design work in the context of consumer contracts. As more contracts become machine-readable, questions emerge over how people will interact with such contracts. Drawing on work at the Stanford Legal Design Lab, several new contract designs have been developed, tested and improved. This initial study led to the identification of key principles and best practices that demonstrate how consumer contracts can be more comprehensible, engaging, and effective. Such research can serve all of the stakeholders by improving disclosures, terms of service, privacy policies, and various other aspects of business-to-consumer contracts. Moreover, it links the literature of contract design for improved usability and outcomes with behavioral economist concerns over choice engines and decision making, legal scholarship on the effectiveness of disclosure as a regulatory mechanism, and HCI research on how best to engage users and help them navigate complex systems.

Charlotta Kronblad and Johanna E. Pregmark focus on the legal industry and highlight how the vast majority of law firms have remained the same without responding to the rising opportunities created by Legal Tech. This reluctance on the part of the mainstream legal industry to adopt new digital technologies has created a bifurcation with a minority of

technology enthusiasts, on one side, and traditional sceptics on the other. This chapter examines the reasons for this situation and discusses the connection between industrial diffusion and the capacity for change of individual firms. The chapter argues that, for the moment, most law firms have neither the technological capabilities or the economical motivation to change, and why digitalization has, instead, become a source of fear. However, in order to seize digital opportunities and adapt to the constantly, and rapidly, changing environment, law firms need to overcome this fear and develop the organizational capacity to change.

Ivar Timmer provides a case study of the Dutch experience with Legal Tech, focusing on the issue of contract automation. It is suggested that the number of organizations that are actively deploying contract automation is still relatively small, but growing. Contract automation can improve legal service delivery to consumers and SMEs, as well as contracting processes within organizations, and several organizations studies as part of this research report positive results. However, successfully implementing contract automation, especially for internal use within organizations, is not simple. Tight budgets, resistance to change and poor integration with other software are some of the problems that organizations encounter. Generally, human and organizational factors are often at least as important as the technological aspects. Nevertheless, in spite of these difficulties, the use of contract automation software in Dutch legal practice can be expected to increase in the near future as more law firms and companies expand their activities. The chapter concludes by exploring the thought that the increased use of contract automation will drive a further harmonization of contracts within various sectors and facilitate other technological applications, such as the automated analysis of contracts. In this way, automation brings multiple potential efficiency gains.

Cecilia Magnusson Sjöberg identifies a range of issues that are raised by “legal automation,” which – as elsewhere in this book – is understood broadly as the use of modern information and communication technologies in a legal context. In particular, the chapter discusses the role of education as the need arise both for IT-professionals to be somewhat in command of IT Law as well as for lawyers to grasp Legal Tech. Another key issue is digital resources management, both within and outside the legal domain. The analysis concerns rights of access, on the one hand, and corresponding restrictions, on the other. For instance, freedom of expression and information are limited by personal data protection, transparency by secrecy, open data by information security and re-use of public sector information (PSI) by intellectual property, etc. Such a “legal landscape of contradictions” is generally speaking why artificial intelligence (AI) comes into the picture as lever of legal system management. At the same time, it is important to remember that there have been attempts to automate law in a broad sense for decades, and that quite a few of the principle challenges concerning decision making systems are still valid. In response to the legal implications of today’s AI developments and implemented applications a new legal entity – digital person – is introduced. The overall purpose is to acknowledge the need for a conceptual model for legal reasoning supplementing the well-established notions of “natural person” and “legal person.”

Marcelo Corrales, Paulius Jurčys and George Kousiouris analyze some of the main legal requirements laid down in the new European General Data Protection Regulation (GDPR) with regard to hybrid Cloud Computing transformations. Significantly, the GDPR imposes several restrictions on the storing, accessing, processing and transferring of personal data. This has generated concerns with regard to its practicability and flexibility given the dynamic nature of the Internet. The current architecture and technical features of the Cloud do not allow adequate control for end-users. Therefore, in order for the Cloud adopters to be legally compliant, the design of Cloud Computing architectures should include additional automated capabilities and certain “nudging” techniques to promote better choices. The chapter explains

how to fine tune and effectively embed these legal requirements at the earlier stages of the architectural design of the computer code. The discussion focuses on Smart Contracts and Service Level Agreements (SLAs) frameworks, which include selection tools that take an information schema and a pseudo-code that follows a programming logic to process information based on that schema. The pseudo-code is essentially the easiest way to write and design computer code, which can check automatically the legal compliance of the contractual framework. This raises a set of legal questions that have been specifically designed to urge Cloud providers to disclose relevant information and comply with the legal requirements established by the GDPR.

Sam Wrigley also examines how automation of contracting will create new legal risks. His chapter focuses on the GDPR, specifically the issue of how data controllers are only allowed to recruit data processors who provide “sufficient guarantees” that they will comply with data protection law. Given the wide definitions of the key terms “processing,” “controller” and “processor,” it seems likely that we will see many situations where at least one of those parties is not acting in a professional capacity, but still comes under the remit of the GDPR (e.g., if the personal data is being processed in a Blockchain). This creates the risk that parties will simply agree to contracts without having read or understood them, leading to significant legal liabilities for both parties and a lack of sufficient protection for data subjects. The chapter examines how parties should arrange their contracts to provide the best possible chance of complying with data protection law, focusing on how controllers can use technological and other non-contractual solutions to compliment such agreements – while still respecting each party's autonomy and freedoms.

Mark Fenwick and Erik P. M. Vermeulen conclude by returning to the broader implications of these developments for the future of the legal profession. Two interconnected arguments are introduced. First, the ongoing “digital revolution” – the expansion of Legal Tech – will continue to disrupt legal work as it has traditionally operated. Several aspects of this disruption, many of which are discussed in multiple chapters, are outlined. Second, in contrast to previous technological revolutions, the “deployment” of disruptive innovation in the context of the digital revolution seems unlikely to be primarily “state-led.” Instead, new technologies will be deployed by a coalition of diverse private actors (entrepreneurs, technologists, consultants, and other professionals) working in collaboration. Crucial amongst these actors will be the lawyer of the future operating as “transaction engineer.” The Chapter outlines this transaction engineer function and its importance in the deployment of emerging digital technologies and for the future of the legal profession.

References

- Asharaf S, Adarsh S (2017) Decentralized Computing Using Blockchain Technologies and Smart Contracts: Emerging Research and Opportunities. Information Science Reference (IGI Global), Hershey
- Blank S (2017) Why lawyers don't run startups. <https://thinkgrowth.org/why-lawyers-dont-run-startups-25c5e0c877ed>. Accessed 10 Sept 2018.
- Bues M-M, Matthaei E (2017) LegalTech on the Rise: Technology Changes Legal Work Behaviors, But Does Not Replace Its Profession. In: Jacob K, Schindler D, Strathausen R (eds) Liquid Legal: Transforming Legal into a Business Savvy, Information Enabled and Performance Driven Industry. Springer, Cham
- Creative Commons (n.d.). About the licenses. <http://creativecommons.org/licenses/>. Accessed 10 Sept 2018.

- Cummins, T (2016) Can Contracts Really Change? IACCM / Commitment Matters Blog, 2 March. <https://www2.iaccm.com/resources/?id=9147>. Accessed 10 Sept 2018.
- Drescher D (2017) Blockchain Basics: A Non-Technical Introduction in 25 Steps. Springer, New York
- Haapio H (2006) Business Success and Problem Prevention through Proactive Contracting. In: Wahlgren P (Ed.), A Proactive Approach. Scandinavian Studies in Law, Vol. 49. Stockholm Institute for Scandinavian Law, Stockholm. <http://www.scandinavianlaw.se/pdf/49-9.pdf>. Accessed 10 Sept 2018.
- Haapio H (2013) Next Generation Contracts: A Paradigm Shift. Lexpert Ltd, Helsinki.
- Haapio H, Passera S (in press). Contracts as Interfaces: Exploring Visual Representation Patterns in Contract Design. In: Katz MJ, Dolin RA, Bommarito M (Eds.) Legal Informatics. Cambridge University Press, Cambridge.
- Hagan M (n.d.) Law by Design. <http://www.lawbydesign.co>. Accessed 10 Sept 2018.
- Hazard J, Haapio H (2017) Wise Contracts: Smart Contracts that Work for People and Machines. In: Schweighofer E et al. (Eds.), Trends and Communities of Legal Informatics. Proceedings of the 20th International Legal Informatics Symposium IRIS 2017. Österreichische Computer Gesellschaft / books@ocg.at, Wien.
- Howarth D (2013) Law as Engineering – Thinking About What Lawyers Do. Edward Elgar, Cheltenham.
- Huang P (2015) A Dissection of Bitcoin. Lulu.com, s. 1.
- Kosba A et al. (2015) Hawk: The Blockchain Model of Cryptography and Privacy-Preserving Smart Contracts. <https://www.weusecoins.com/assets/pdf/library/Hawk%20%20The%20Blockchain%20Model%20of%20Cryptography%20and%20Privacy-Preserving%20Smart%20Contracts.pdf>. Accessed 10 Oct 2017
- Kost de Sevres (2016) The Blockchain Revolution, Smart Contracts and Financial Transactions <https://www.dlapiper.com/en/uk/insights/publications/2016/04/the-blockchain-revolution/>. Accessed 10 Oct 2017
- LeDA / Legal Design Alliance (n.d.) <https://www.legaldesignalliance.org>. Accessed 10 Sept 2018.
- Linthicum D (2016) Linking Up Blockchain and Cloud <https://www.cloudtp.com/doppler/linking-blockchain-cloud/>. Accessed 20 Nov 2017
- Lipshaw JM (2018) The Persistence of 'Dumb' Contracts. Suffolk University Law School Research Paper No. 18-11, 25 June, last revised 6 Sep (Stanford Journal of Blockchain Law & Policy, 2019, Forthcoming). <https://ssrn.com/abstract=3202484>. Accessed 10 Sept 2018.
- Morabito V (2017) Business Innovation Through Blockchain: The B³ Perspective. Springer, Cham
- Mougayar W (2015) Understanding the Blockchain: We Must Be Prepared for the Blockchain's Promise to Become a New Development Environment <https://www.oreilly.com/ideas/understanding-the-blockchain>. Accessed 16 May 2017
- Prusty N (2017) Building Blockchain Projects: Develop Real-time Practical DApps using Ethereum and JavaScript. Packt Publishing, Birmingham
- Siedel G, Haapio H (2011) Proactive Law for Managers: A Hidden Source of Competitive Advantage. Gower, Farnham.
- Swan M (2015) Blockchain: Blueprint for a New Economy, (1st edn). O'Reilly, Sebastopol (CA)
- Stark J (2016) How Close Are Smart Contracts to Impacting Real-World Law? <http://www.coindesk.com/blockchain-smarts-contracts-real-world-law/>. Accessed 16 May 2016
- Szabo N (1997a) Contracts with Bearer http://szabo.best.vwh.net/bearer_contracts.html.

- Accessed 17 Oct 2017
- Szabo N (1997b), The Idea of Smart Contracts http://szabo.best.vwh.net/smart_contracts_idea.html. Accessed 17 Oct 2017
- The Economist (2015a) The Great Chain of Being Sure About Things <http://www.economist.com/news/briefing/21677228-technology-behind-bitcoin-lets-people-who-do-not-know-or-trust-each-other-build-dependable>. Accessed 15 Oct 2017
- The Economist (2015b) Bitcoin: The Next Big Thing. <http://www.economist.com/news/special-report/21650295-or-it-next-big-thing>. Accessed 15 May 2016
- Tomas P (2017) Cryptocurrency 101: A Beginners Guide. Pronoun.
- Walch A (2018) Open-Source Operational Risk: Should Public Blockchains Serve as Financial Market Infrastructures? In: Lee D, Deng R (eds) Handbook of Blockchain, Digital Finance, and Inclusion, vol. 3. Academic Press, London
- Waller R, Haapio H, Passera S (2017) Contract Simplification: the Why and the How. Contracting Excellence Journal, July 24, <http://journal.iaccm.com/contracting-excellence-journal/contract-simplification-the-why-and-the-how>. Accessed 10 Sept 2018
- Wattenhofer R (2016) The Science of the Blockchain, Inverted Forest Publishing, s. 1.
- Weber I et al. (2016) Untrusted Business Process Monitoring and Execution Using Blockchain. In: La Rosa M, Loos P, Pastor O (eds.) Business Process Management, 14th International Conference, BPM 2016, Rio de Janeiro, Brazil, September 18-22, 2016, Proceedings. Springer, Cham
- Williams D (2017) Cryptocurrency Compendium: A Reference for Cryptocurrencies. Lulu.com