

Perspectives in Law, Business and Innovation

Marcelo Corrales
Mark Fenwick
Helena Haapio *Editors*

Legal Tech, Smart Contracts and Blockchain



Perspectives in Law, Business and Innovation

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Over the last three decades, interconnected processes of globalization and rapid technological change—particularly, the emergence of networked technologies—have profoundly disrupted traditional models of business organization. This economic transformation has created multiple new opportunities for the emergence of alternate business forms, and disruptive innovation has become one of the major driving forces in the contemporary economy. Moreover, in the context of globalization, the innovation space increasingly takes on a global character. The main stakeholders—innovators, entrepreneurs and investors—now have an unprecedented degree of mobility in pursuing economic opportunities wherever they arise. As such, frictionless movement of goods, workers, services, and capital is becoming the “new normal”.

This new economic and social reality has created multiple regulatory challenges for policymakers as they struggle to come to terms with the rapid pace of these social and economic changes. Moreover, these challenges impact across multiple fields of both public and private law. Nevertheless, existing approaches within legal science often struggle to deal with innovation and its effects.

Paralleling this shift in the economy, we can, therefore, see a similar process of disruption occurring within contemporary academia, as traditional approaches and disciplinary boundaries—both within and between disciplines—are being re-configured. Conventional notions of legal science are becoming increasingly obsolete or, at least, there is a need to develop alternative perspectives on the various regulatory challenges that are currently being created by the new innovation-driven global economy.

The aim of this series is to provide a forum for the publication of cutting-edge research in the fields of innovation and the law from a Japanese and Asian perspective. The series will cut across the traditional sub-disciplines of legal studies but will be tied together by a focus on contemporary developments in an innovation-driven economy and will deepen our understanding of the various regulatory responses to these economic and social changes.

The series editor and editorial board carefully assess each book proposal and sample chapters in terms of their relevance to law, business, and innovative technological change. Each proposal is evaluated on the basis of its academic value and distinctive contribution to the fast-moving debate in these fields.

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Legal Tech, Smart Contracts and Blockchain

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Preface

This volume is part of the book series: *Perspectives in Law, Business and Innovation*. The aim of this series is to provide a forum for the publication of cutting-edge research in the fields of innovation and the law from a global perspective. The series aims to cut across the traditional sub-disciplines of legal studies, but is tied together by a focus on deepening our understanding of the various responses to technological, economic and social change.

This volume constitutes the result of a joint cooperative effort drawing on the extensive global network of three academic institutions: The Institute of European and American Studies, part of the Academia Sinica (Taipei, Taiwan), the Graduate School of Law, part of Kyushu University (Fukuoka, Japan) and the School of Accounting and Finance, Business Law, part of the University of Vaasa (Vaasa, Finland). Contributors to this book—including business, management, software engineering, design and legal scholars and practitioners from Europe, East Asia and the Americas—attempt to provide some of the latest thinking and assessment of current challenges and opportunities with regard to Smart Contracts, Blockchain and Legal Tech and Design.

The main target audience of the book comprises two different groups. The first group belongs to the legal community—particularly, legal scholars, law students and practitioners—in the field of technology or contract law who are interested in an up-to-date legal analysis of current trends. The second group are experts in the fields of Cloud Computing, Smart Contracts and Blockchain—including, service and infrastructure providers, IT managers, chief executive officers (CEOs), chief information officers (CIOs), designers and software developers—who are interested in, and influenced by, some of the shortcomings and benefits of the current legal issues under scrutiny in this work.

The editors would like to thank the Editor-in-Chief of this book series, Prof. Toshiyuki Kono, for opening the doors to this project and for his support. The editors are also indebted to the authors and co-authors of each chapter for their hard work, patience and cooperation throughout the whole process from initial concept to the final manuscript. Finally, the editors are grateful to the Springer staff for their support and efforts in ensuring final publication.

Taipei, Taiwan
Fukuoka, Japan
Helsinki, Finland

Marcelo Corrales
Mark Fenwick
Helena Haapio

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Acronyms

| | |
|--------|---|
| AEPD | Agencia Española de Protección de Datos (Spanish Data Protection Agency) |
| AGI | Artificial General Intelligence |
| AI | Artificial Intelligence |
| APIs | Application Programming Interfaces |
| ARTIST | Advanced Software-based Service Provisioning and Migration of Legacy Software |
| AUAS | Amsterdam University of Applied Sciences |
| B2B | Business-to-Business |
| B2C | Business-to-Consumer |
| BCRs | Binding Corporate Rules |
| CAS | Contract Automation Software |
| CEOs | Chief Executive Officers |
| CFOs | Chief Financial Officers |
| CIOs | Chief Information Officers |
| CJEU | Court of Justice of the European Union |
| CM | Contract Management |
| CRM | Customer Relationship Management |
| DAO | Decentralized Autonomous Organization |
| DLT | Distributed Ledger Technology |
| DM | Data Management |
| DNA | Deoxyribonucleic Acid |
| DPD | Data Protection Directive |
| EEA | European Economic Area |
| EU | European Union |
| EU DPA | European Union Data Protection Authority |
| EULA | End-User License Agreement |
| FCPA | Foreign Corrupt Practices Act |
| FINRA | Financial Industry Regulatory Authority |
| FTP | File Transfer Protocol |

| | |
|------------|--|
| GDPR | European General Data Protection Regulation |
| GUI | Graphical User Interface |
| HTML | Hypertext Markup Language |
| IaaS | Infrastructure as a Service |
| IACCM | International Association for Contract and Commercial Management |
| ICO | UK Information Commissioner's Office |
| ICT | Information and Communication Technology |
| IoT | Internet of Things |
| IP | Internet Protocol |
| IRS | Internal Revenue Service |
| ISO | International Standardization Organization |
| ISP | Internet Service Provider |
| IT Law | Information Technology Law |
| JSON | JavaScript Object Notation |
| LeDA | Legal Design Alliance |
| Legal Tech | Legal Technology |
| NDA | Non-disclosure Agreement |
| NLP | Natural Language Processing |
| OECD | Organization for Economic Cooperation and Development |
| OPTIMIS | Optimized Infrastructure Services |
| PaaS | Platform as a Service |
| PbD | Privacy by Design |
| PCs | Personal Computers |
| PPL | Proactive/Preventive Law |
| PSI | Public Sector Information |
| QoS | Quality of Service |
| SaaS | Software as a Service |
| SCCs | Standard Contractual Clauses |
| SL | Source Language |
| SLAs | Service-Level Agreements |
| SMEs | Small- and Medium-Sized Enterprises |
| TCP | Transmission Control Protocol |
| TL | Target Language |
| UK | United Kingdom |
| UML | Unified Model Language |
| UN | United Nations |
| US | United States |
| USD | United States Dollars |
| VMs | Virtual Machines |
| XML | eXtensible Markup Language |

Digital Technologies, Legal Design and 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. The chapter outlines some of the main features of this on-going transformation process, describes 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, or “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

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

² Bues and Matthaei (2017), p. 90.

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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. 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.⁵

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 various subfields such as automated contracts, e-discovery, online dispute resolution, legal analytics, Blockchain-based technologies and, in particular, Smart Contracts.⁶

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 what we call the Legal Design of Smart Contracts. 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 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, Sect. 5 briefly summarizes each of the chapters and identifies key themes.

2 Blockchain and 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.⁷

³Bues and Matthaehi (2017), p. 90.

⁴Bues and Matthaehi (2017), p. 90.

⁵Bues and Matthaehi (2017), p. 90.

⁶Bues and Matthaehi (2017), p. 90.

⁷The Economist (2015a).

The Blockchain “acts as a consistent transaction history on which all ‘nodes’ eventually agree.”⁸ 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).⁹

The Blockchain is also a verification system that enables—*among other things*—crypto-currencies 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.¹⁰ This technology enables not only crypto-currencies but also different kinds of applications, platforms, information storage and distribution systems.¹¹ 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.¹²

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.¹³ Each block follows the other one successively and this is what creates the Blockchain.¹⁴

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.¹⁵ For this very reason, the Blockchain can be regarded as an authoritative public database with a very high level of trust.¹⁶

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.

⁸Wattenhofer (2016), p. 85.

⁹Swan (2015), p. 16.

¹⁰Walch (2018), p. 245.

¹¹Tomas (2017), Introduction.

¹²Asharaf and Adarsh (2017), p. 33.

¹³Kost de Sevres (2016).

¹⁴Mougayar (2015).

¹⁵Mougayar (2015).

¹⁶Stark (2016).

As such, the Blockchain creates more transparency and allows otherwise mutually distrustful parties to contract safely without intermediaries.¹⁷ 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.¹⁸ 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.¹⁹

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.²⁰ 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.²¹

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.²² 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 2008.²³ 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.²⁴

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.

¹⁷Kosba et al. (2015), p. 1.

¹⁸Linthicum (2016).

¹⁹Wattenhofer (2016), p. 88.

²⁰Morabito (2017), p. 167; Drescher (2017), p. 5.

²¹Huang (2015), p. 3.

²²The Economist (2015b).

²³Bues and Matthaai (2017), p. 90.

²⁴Prusty (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.”²⁵ 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.”²⁶ 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.”²⁷

The idea of Smart Contracts was popularized by computer scientist Nick Szabo. 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,”²⁸ since anyone with money can engage in a transaction with the vendor.²⁹

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.³⁰

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.

²⁵Weber et al. (2016), p. 330.

²⁶Kost de Sevres (2016).

²⁷Wattenhofer (2016), p. 88.

²⁸Szabo (1997a).

²⁹Szabo (1997b).

³⁰Stark (2016).

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 spark 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 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 service or interface to improve that experience and empower people in new and previously unimagined ways. The next section considers the application of human-centered design to prevent or solve legal problems that new technologies are creating, 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.³¹

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.”³²

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,

³¹For 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.).

³²For “dumb” contracts, see Lipshaw (2018).

the overwhelming majority of contracts merit those descriptions.”³³ 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.³⁴ 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?
- 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 it is easy to understand. How best to do all of these things, is a question deeply rooted in the discipline of information design.³⁵ 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

³³Cummins (2016).

³⁴LeDA/Legal Design Alliance (n.d.).

³⁵Haapio and Passera (in press).

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.³⁶ 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.³⁷

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.”³⁸ Contracts themselves can be viewed as interfaces,³⁹ and information design methods and strategies can be used to simplify them.⁴⁰ Legal Design can help change mindsets, too, so the move toward a new paradigm—we call it Next Generation Contracts—can begin.

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”⁴¹—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 (Table 1).

³⁶Haapio (2013), p. 79.

³⁷See “Three “Layers” of Licenses” at Creative Commons (n.d.).

³⁸Howarth (2013), p. 67.

³⁹Haapio and Passera (in press).

⁴⁰Waller et al. (2017).

⁴¹Hazard and Haapio (2017).

Table 1 Moving to next generation contracts

| 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 |

Adapted from Haapio (2013), pp. 41–42 and Waller et al. (2017)

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 he claims that lawyers have always been poor at running innovative companies and that they often hold back such companies.⁴² 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

⁴²<https://thinkgrowth.org/why-lawyers-dont-run-startups-25c5e0c877ed>.

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 designers and “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 designers and technologists in order to find user-friendly 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 focusing on adding genuine value by utilizing the current technological developments and Legal Design methodologies. For instance, how can we create an easy-to-use 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.

5 Chapters

Each of the chapters collected here addresses 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 departments

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 nor 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 arises 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 main 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 processing 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 complement 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.

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