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Commercial Law in an Age of Automation: Upstream Planning to Forestall Downstream Transaction Costs

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ABSTRACT

This article examines commercial law in transition as data analytics allows many evaluative and transactional processes to be automated. Based on research and interviews conducted in four financial centers, the article posits that both lawyers and financial professionals will engage more in more abstract, preparatory activity to construct the logical cores for algorithmically automated processes and spend less time performing the processes themselves. This move upstream away from direct contact with underlying data and clients will nudge the "liberal professions" toward the rational organizing principles of industry in general.

🔍*Keywords: Commercial Law, Fintech, Legaltech, Regtech, Data Analytics, Automation, Artificial Intelligence*

CONTENTS

I.   INTRODUCTION

Commercial law in the second decade of the 21st century will have to accommodate the competitive push from many market participants to automate a number of their operating functions, ranging from analysis and preparation of documents used in contracting and litigation to the actual offer and acceptance for contracting. The "tech" in fintech, legaltech and regtech refers in each case to the automation of some activity previously performed by a human agent.[1] These activities are always abstractly logical rather than physically mechanical,[2] and thus the "tech" does not entail any robotics despite the growing prominence of "chatbots" in law, finance and regulation.[3] Instead, the entry of this "tech" into commercial dealings, such as through fintech, involves in most cases the digitalization and automated processing of key components in or regarding the "legal relationship" that establishes rights and duties between contracting parties or between such parties and their property.[4] In legaltech, the "tech" involves – beyond internal systems to manage and optimize law firm operations – primarily the analytical activity of sifting through data in search of patterns useful in preparing for litigation, structuring a corporate transaction or assessing a contract.[5] In the case of assets evidenced in distributed

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[1] Good studies that lay out the nature and breadth of these areas include (for fintech) Miguel Soriano et al, "The ASEAN Fintech Ecosystem Benchmarking Study" (Univ. of Cambridge Judge Bus. Sch. The Cambridge Centre for Alternative Finance 2019); (for legaltech) International Legal Technology Association, "Artificial Intelligence & Machine Learning" (2019); and (for regtech) Viki Waye, "Regtech: A New Frontier in Legal Scholarship," 40 *Adelaide Law Review* 363 (2019).

[2] Such activities inevitably include the collection, arrangement or recognition of patterns in data, and never entail moving or manipulating physical objects. As such, they are not limited by the restricted mobility, dexterity or agility of machines.

[3] *See* e.g., Robert Dale, "Industry Watch Law and Word Order: NLP in Legal Tech," 25(1) *Natural Language Engineering* 211-217 (2018).

[4] Here, reference is made to the key civil law concept of legal relationship, which is rendered in German by *Rechtsbeziehung* and in Taiwanese by 法律關係. Examples are provided in the following paragraph.

[5] Early industry leaders in these activities are Relativity (discovery documents analysis, https://www.relativity.com/), Luminance (transactional document analysis, https://www.luminance.com/) and LawGeex (contract analysis, https://www.lawgeex.com/).

ledgers (DLT or blockchain), it also means digitalization of the property itself.[6] All of these changes can take place because the relevant information used by parties and the way they deal with their assets has been digitalized, data connections like the internet make the data remotely accessible through broad and pervasive networks, and advances in computer science allow the accurate evaluation of such data through data analytics.[7] The "tech" being added to finance, law and regulation thus indicates an automation of relational dealing over a network of digital communication.

An example from a stylized scenario of fintech operations in a bank can make this clear by briefly reviewing how the "tech" facilitates the banking relationship from beginning to end of a transaction. At the outset of a commercial relationship, the bank must "know its customer" when entering into the service relationship and such knowledge of identity and capacity can now – regulation permitting – be gathered by biometric analysis of identifying data, such as facial recognition, that is linked to permanent and digitally available records.[8] Once the relationship has been established as a matter of identity and risk profile, a customer's creditworthiness can also be evaluated by using parameters determined from historical data and applied to the data available regarding the specific customer, such as employment, salary, credit history, banking data and anything else permitted by law and found relevant.[9] If this analysis results in a decision to grant credit, the funds can be released and transferred electronically and include triggers that function automatically, such as rolling credit with limits, as used in credit cards and credit facilities.[10] The contract supporting this grant of credit could be pre-programmed into a "smart" portal, so that customer dealing triggers bank response.[11] If the customer defaults on this obligation, the failure to make payment by a specified date could trigger both an automatic removal of remaining credit and a seizure of any digitally available collateral, such as invoice receipts offered to secure the arrangement. Comparable automation can be arranged in the practice of law or the exercise of regulatory power provided information underlying a decision to act one way or another exists in digital form, historical data is at hand determining how that information should be analyzed, and clear rules exist on how the result of the analysis should be

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[6] Although dematerialized, intangible assets existing in registers have been in common use for hundreds of years, blockchain for the first time offers a ledger system in which the coded protocol itself determines the creation and existence of the relevant assets, so they become completely system-endogenous. *See* Michel Rauchs et al., "Distributed Ledger Technology Systems: A Conceptual Framework" (Univ. of Cambridge Judge Bus. Sch. The Cambridge Centre for Alternative Finance Aug. 2018), p. 37.

[7] The term "data analytics" generally refers to the activity of "extracting nonobvious and useful patterns from large data sets." John D. Kelleher, *Data Science* (MIT Press, 2018), p. 1.

[8] *See* e.g., Hong Kong Financial Services Development Council, "The Future of FinTech in Hong Kong," FSDC Paper No.29 (May, 2017), pp. 30-33.

[9] *See* e.g., David C. Donald, "Smart Precision Finance for Small Businesses Funding," 21 *European Business Organization Law Review* 1-19 (2020).

[10] *See* ibid, at pp. 10-11.

[11] "Generally, smart contracts are computer protocols that implement the terms of a negotiated contract in a self-executing manner." Jenny Cieplaka & Simon Leefatt, "Smart Contracts: A Smart Way to Automate Performance," 1 *Geo. L. Tech. Rev.* 417, 418 (2017).

applied. Thus thousands of documents gathered in anticipation of a corporate merger can be automatically analyzed for key clauses, such as contractual conditions triggered upon a change of control or expired regulatory approvals.[12]

The use of automated processes means that activity previously requiring one human or a team thereof to access information, analyze what they have learned, and compose any written work product, alternating between accessing information and using it to produce work product drafts as they spiral toward a finished product, can now incorporate processes undertaken rapidly – almost instantly – on the basis of laboriously prepared systems and programs. The activity of the young lawyer, who in the past may have read a contract, checked the law on a given clause and returned to reread the contract a second time, can be replaced by an analytic engine that rapidly scans the contract using a broad archive of information about the law applicable to such contracts. These automated processes will require significant upstream planning and preparation to construct logical sequences that will be applied automatically to eliminate downstream transaction costs.

From today's limited vantage point, it therefore appears that financial institutions, law firms and regulators will require staff capable of an abstract, almost academic, view of the processes involved in reaching a decision or executing a transaction relevant for the organization in question in order to construct models of application. Once these models are designed, engineers (computer scientists) will arrange the interfaces that allow data to be received and analyzed and results to be acted upon. These two steps constitute the "legal engineering"[13] that builds the models and writes the programs necessary to translate the previously human analytical or operational activity into an automated process. A law firm, financial institution, or regulator that operates in this way will need employees with a different skillset than previously required, and significantly change the training arch of the same. The question of liability vis-à-vis third parties for these automatic actions is an issue much discussed regarding artificial intelligence, and appears to present the problem of choosing among the many theories developed during the long history of owner liability for domestic animals, machines, automobiles, and algorithmic trading in securities markets, as well as the various highly developed theories of product liability.[14]

This article briefly presents the major shift in commercial law practice that can currently be foreseen as likely during the coming period of automation. It arranges the points of focus into five discursive sections. Building on this introduction, Section 2 reviews the prerequisites for automation: data, processing tools, and communication networks for delivery. In effect, it explains why this is occurring now and what environmental developments support fintech,

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[12] The document review company Luminance describes its service as: "Pattern-recognition technology reads, understands and learns from the interaction between lawyers and documents, pinpointing warning signs that would be missed during a manual review." https://www. luminance.com/index.html.

[13] The author would like to thank Noemie Alintissar-Mooney of the Singapore Future Law Innovation Programme (FLIP) for outlining how the role of "legal engineer" – requiring a combination of legal and computer science skills – is evolving in the legal profession.

[14] These are discussed in Section 4, below.

legaltech and regtech. Section 3 examines the preparatory creation of logical sequences for algorithmic protocols, both from a conceptual and a staffing point of view. It builds on information we have both about traditional forms of human training and the design of algorithms for securities trading, as well as referring to some early experience with the legaltech business models. Section 4 focuses on major issues of ongoing practice using automated systems, particularly problems of monitoring, updating and liability. Section 5 concludes.

II. THE NETWORKED BUSINESS ENVIRONMENT

Commercial activities automated through "fintech" and "legaltech" have been made possible by the confluence of three main developments. First, information, such as accounts, correspondence and invoices, has been reduced to digital format as more and more records are processed on computers. Second, a network became available on which most people can transmit data to communicate. Third, computer programs and processor capacity capable of using effectively the digital data communicated have become generally available.

These three elements converged early in the enclosed and highly limited world of major securities exchanges, resulting in so-called "program trading" in the 1980s for index arbitrage or portfolio management,[15] the imperfect behavior of which was understood to contribute to the market crash of 1987.   As financial markets essentially deal with securities and cash booked to account, the transition to electronic transfer took place early.[16] The environment of a securities exchange has always been designed as a network among traders, so the transition to a network of electronic data transmission was relatively natural. Contracting takes place automatically as market orders trigger limit orders according to a standard algorithm of price and time priority,[17] so automated contracting is standard procedure. Price data and analysis of trends and behavior of such data have always been superabundant in the securities markets,[18] allowing models of price behavior to be constructed. The competitive incentive for traders to invest in computing power to put these three elements together is obvious. The result was an environment in which contracts were increasingly made between computers operating on behalf of humans.[19] As these contracts arose under system rules among a closed set of highly qualified and carefully screened professionals, little or no question of their legal enforceability arose.

In the 1990s, a more broadly accessible network for data transfer became available in the form of the internet, and this coincided with increasing availability of personal computing

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[15] Joel Seligman, *The Transformation of Wall Street: A History of the Securities and Exchange Commission and Modern Corporate Finance* (Aspen Publishers, 3rd ed. 2003), pp. 598-599.

[16] This was a significant part of London's "big bang" in 1986. *See* Ranald Michie, *The London Stock Exchange: A History* (Oxford University Press, 2001), pp. 553-554.

[17] Robert A. Schwartz & Reto Francioni, *Equity Markets in Action: The Fundamentals of Liquidity, Market Structure & Trading* (Wiley & Sons, 2004), p. 164.

[18] Already in 1900, Louis Jean-Baptiste Alphonse Bachelier had enough data on the Parisian warrant market to develop the statistical theory of random walk pricing. Andrew W. Lo, *Adaptive Markets: Financial Evolution at the Speed of Thought* (Princeton University Press, 2016), p. 18.

[19] *See* Irene Aldridge, *High-Frequency Trading: A Practical Guide to Algorithmic Strategies and Trading Systems* (Wiley & Sons, 2nd ed. 2013), pp. 33-34.

power,[20] giving birth to electronic commerce. A major commercial law question at the time was how consumers could enter into contracts over the internet with no writing and with a counterparty that is an automated system operated by a company like Amazon. This uncertainty arising from automation in e-commerce was addressed through "electronic agent" laws, such as the 1999 Uniform Electronic Transactions Act, which referred to automated contracting systems as an "electronic agent," defined as "a computer program or an electronic or other automated means used independently to initiate an action or respond to electronic records or performances in whole or in part, without review or action by an individual."[21] Compliance with laws on electronic agents ensured that e-commerce contracts entered into this way were binding and enforceable.

During the 2000s and 2010s an explosion of data arising mainly from use of smart phones and online platforms such as Amazon, Google and Facebook coincided with advances in computer science allowing electronic agents greater autonomy in limited areas of action.[22] Machine learning, deep learning with neural networks and other forms of limited artificial intelligence (AI) created an ability for computers to process data in a manner that is now consistently exceeding human performance for limited tasks,[23] such as facial recognition of customers, assessing risk and evaluating creditworthiness, scanning documents for particular types of phrasing and issues, and making predictions about institutional behavior.[24] This has brought commercial lawyers into the current era of fintech, legaltech and regtech.

Legaltech in its current form focuses on three activities (if one looks beyond accounting and client management systems which are also sometimes referred to as legaltech): scanning documents to spot relevant legal issues,[25] constructing schematic documents like contracts,[26] and predicting the future behavior of a tribunal in a given case at hand.[27] Digitalization of the

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[20] *See* MEJ Newman, *Networks: An Introduction* (Oxford University Press, 2001), sec. 2.1.

[21] Uniform Electronic Transactions Act, s 2(6).

[22] *See* e.g., Erik Brynjolfsson & Andrew McAfee, *The Second Machine Age: Work, Progress, and Prosperity in a Time of Brilliant Technologies* (W. W. Norton & Company, 2014), pp. 66-69.

[23] "One of the clearest examples of these accelerating improvements is the ImageNet competition.... By 2017, almost every team had driven error rates below 5 percent—approximately the accuracy of humans performing the same task... computer vision has now surpassed human capabilities and dramatically expanded real-world use-cases for the technology.... New algorithms constantly set and surpass records in fields like speech recognition, machine reading, and machine translation." Kai-Fu Lee, *AI Superpowers: China, Silicon Valley, and the New World Order* (HMH Books, 2018), p. 161.

[24] In 2017, a data analytics engine achieved 86.6% accuracy (compared to 100 commercial lawyers, who achieved 62.3% accuracy) in predicting the behavior of the UK Financial Ombudsman in 775 payment protection insurance mis-selling cases. Rory Cellan-Jones, "The robot lawyers are here - and they're winning," *BBC News* (1 November 2017).

[25] Two early industry leaders in document review, Lumiance and Relativity, are referenced above.

[26] Thompson Reuters is an early leader in the area of automated contract assembly, with its product, "Contract Express", *see* https://legalsolutions.thomsonreuters.co.uk/content/dam/openweb/documents/pdf/uki-legal-solutions/brochures/contract-express-law-firms-brochure.pdf.

[27] *See* note 24, above.

documents to be analyzed, laws, judicial decisions, an archive of existing contract clauses or other relevant legal documents is one prerequisite. A second is the network to access them, which in the scanning and composition activities could be local, but in predictive analysis is probably the internet. The protocols used to scan and assemble documents are essentially professional know-how, the kind that might otherwise be passed from senior lawyers to junior lawyers. Programming a document review or assembly strategy into a computer has a number of advantages for the firm's current generation of partners over entrusting these tasks to the next generation: the computer never forgets, distorts or neglects to apply any aspect of the information or instruction; the IP rights in the program would be easier to guard against theft than would a departing lawyer's use of skills learned; when the automated applications are applied in multiple locations simultaneously, any learning or updating experienced in one location can in real time be transferred to the other locations with complete accuracy; and as the computer improves in skill and competence, it will not seek to share the firm's profits or control its management.

The development of regtech has depended on much the same set of elements and has in most cases been easier from a technical point of view because regulators are, in nearly every case, hubs of information centralization and this information has been digital for decades. If we take the SMARTS system developed by Mike Aiken,[28] for example, it required raw trade data fed from the securities exchange to the regulator. Next, it required sufficiently ample empirical studies of market manipulation to allow the modeling of the kinds and combinations of trades that exhibit a high probability of such manipulation. Third, it required an analytical engine capable of applying the model to the stream of data arriving from the securities exchange. In the SMARTS system, when the data flow matches the patterns indicating possible market manipulation, the regulator receives an alert and can choose to act.[29] Making a system like SMARTS fully automatic would be a difficult problem for regtech, as the delegation of government police power to an automatic mechanism raises serious issues of due process. However, using the automated system to support human, regulatory decision-making essentially becomes a question of evidentiary quality, so that computerized systems and processes can be examined and held accountable.

This article takes the position that the new developments giving rise to the automation discussed above do not present a qualitative break from that existing under tools already well established and assimilated into the system of commercial and regulatory law. With regard to enforceability of transactions entered into with electronic agents using machine learning or other forms of limited AI, they merely represent an increased level of autonomy in the agent – moving from an agent for a special purpose to a general agent under the law of agency.[30] As such, the

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[28] *See* e.g., Feras Dabous & Fethi Rabhi, "Information Systems and IT Architectures for Securities Trading," in *Handbook on Information Technology in Finance*, Detlef Seese, et al eds. (Springer, 2008) pp. 39-42.

[29] The system also provides real-time information on broker spreads and possible broker collusion, which is equally useful for regulatory purposes. *Ibid*.

[30] *See* e.g., Peter Watts & FMB Reynolds, *Bowstead & Reynolds on Agency* (Sweet & Maxwell, 2014), p. 39.

range of activity in which they can engage has increased substantially and thus so has their presence in business, which is changing the way that finance, law and regulation are organized and operated. This range, however, is the result of meticulous modeling and planning, based on enormous amounts of accumulated data and its careful analysis. Before the automated system can whirl its way rapidly through dense data to reach a useful result, the path – or processes that find that path – must be prepared. This is the new "upstream" task of the commercial lawyer.

III. CODING THE FILTERS FOR LEGAL ANALYSES AND DECISIONS

As outlined above, the three "techs" examined in this article require data, networks, and computing capacity. The emergence of a data-rich society and the freely accessible network to connect persons within this society were phenomena beyond the scope of any single actor to achieve or significantly influence, but once these had grown to become strong and pervasive, institutions and companies have acted in various ways to join, augment and capitalize on the new environment. Innovative possibilities fueled a stock market boom of e-commerce startups in the late 1990s, and when the market came down it left behind solid e-commerce firms like Amazon and eBay. Wireless data networks in the 2000s stimulated both Apple's smartphone market and social networking firms like Facebook and WeChat. Both government and private projects to digitalize law have changed the landscape of access to legal sources. The US and the EU, for example, have made nearly all statutes, cases and proposals – as well as regulatory frameworks – available digitally.[31] Most governments, small and large have followed suit.[32] Harvard University's Caselaw Access Project has also greatly assisted the progress of legaltech by offering tens of thousands of older cases online free of charge.[33]

In this tightly networked and data-rich environment, data analytics can be used to evaluate and compile information in a manner that otherwise would have taken humans much longer to perform. As mentioned above, this development was visible earlier in securities trading, where within the network of broker-dealers and the exchanges algorithms were designed by bringing historical trading data together with planned trading strategies.[34] The human efforts in trading were then shifted largely to preparation, so that – for film buffs – the process may look something like the classic confrontation between Jet Li and Donnie Yen toward the beginning of Zhang Yimou's 2020 film, *Hero*: the two meditate, mentally picturing the blows and counterblows of a long and complex fight so thoroughly that when they open their eyes to actually fight each other the matter is settled with a single thrust. The same rapid execution once limited to algorithmic trading can now be found in the broader context of average commerce and professional dealings.

"Smart contracts" are a good example of extensive preparation followed by automatic

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[31] For the US, these are available at https://www.govinfo.gov/ and for the EU at https://ec.europa. eu/info/law_en.

[32] All Hong Kong legislation is available in both English and Chinese at https://www. elegislation.gov.hk/.

[33] *See* https://lil.law.harvard.edu/projects/caselaw-access-project/.

[34] The process is outlined in Dave Cliff et al, "Technology trends in the financial markets: A 2020 vision," Foresight Driver Review – DR3 (2013).

execution. Rauchs et al define smart contracts as "programmatically-executed transactions (PETs)," which "are computer scripts that, when triggered by a particular message, are executed by the system. When the code is capable of operating as all parties intend, the deterministic nature of the execution reduces the level of trust required,"[35] because the code – not a human actor – determines what will happen. As is well known, when conceiving the idea of smart contracts within a distributed ledger environment, Nick Szabo compared them to a vending machine.[36] Vending machines are generally designed to contract with customers in the complete absence of the machine's owner, and the latter's effort in the contracting process is solely preparatory – designing, building, programing and stocking the machine. For a smart contract, the terms of the contract would be worked out, and such terms would have to allow automatic contracting in the future without significant modification for individual instances. Such preprogrammed contracts present problems not found in custom-designed contracts for specific contracting parties.[37]

In a world where banking, legal and regulatory operations and practice are undertaken by extensive data collection and analysis, creation of automated processes and rapid execution of the same, banking, legal and regulatory professionals will move their focus to upstream preparation and continuous monitoring, as is the case in computer-driven securities trading. Officers of legaltech firms in Hong Kong, Singapore, the UK and Germany explained to the author in interviews during the winter of 2019/20 that much of the activity central to a legaltech model is to map out categories and subcategories of legal concepts and plot the decision tree logic among such concepts as well as assemble programming capable of interacting well with the natural language in which legal concepts are expressed. The patterns of relationship and decision make up the core logic of an algorithm encoded into the data analytics system. If the task of the system is to scan corporate documents in advance of a planned acquisition of a company, one algorithm to be coded into the system would be (i) to sort for legally or financially important contracts, leases and licenses, (ii) within those documents search for words indicating that a change of control over the company will or can lead to rescission of the contract, lease or license, and (iii) highlight or queue these documents for human review and action.[38] If the task of the system is to provide advice on or warning of a potential regulatory violation, an algorithm coded into such system would (i) scan for the type of actions that are

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[35] Rauchs, note 6, above.

[36] *See* Nick Szabo, "Smart Contracts: Formalizing and Securing Relationships on Public Networks" 2(9) *First Monday* (1997).

[37] Until discretion and flexibility can be coded into such contracts and operate in satisfactory ways, a smart contract will have many of the disadvantages seen in automatic penalty clauses and conditioned performance.

[38] This core logic does not exclude the possibility of machine learning discovering novel relationships. Take, for example, a case in which the historical data used to implement a document analysis engine shows a correlation between a pattern of increasing executive pay over the preceding five years and false representations made by the buyer (perhaps because of a rent-seeking motive of the selling directors). Such correlation would demand increased vigilance, and perhaps investigation, by the asset purchaser.

prohibited or regulated by an oversight body, (ii) scan for determining parameters such as type, size, indication of approval sought or required disclosure made that are determinative in applying the regulatory framework, and (iii) either specify action to be taken/not taken or queue for human review.[39]

The preparation of fact, issue and rule sequences allowing the coding of a legaltech algorithm requires a lawyer to engage in the construction of complex hypothetical cases having multiple alternative outcomes. The series of facts and decisions leading to each of these possible outcomes must be mapped in relation to other alternatives having a common root. In order to write such protocols for translation into an algorithm, a lawyer will have to understand the types of facts a given document or event would contain, the issues that would be presented by such facts in a given context, and the manner in which further facts will or will not trigger a move from a latent to an actual problem to be addressed, and the options for addressing such problem. Thus, instead of a lawyer wading though the lives and actions of her clients and then relating their needs to the law, she would hypothetically imagine and plot possible lives and actions, adjusting models as necessary. This activity looks like a shift toward a more academic and speculative engagement with the law and its setting, which parallels the development of recent decades in securities trading, as "quants" designing trading algorithms came to replace gregarious traders who waded into the market and moved with its rhythms.[40]

When bankers and lawyers design systems that then carry out much of the work in swift and automatic fashion, not only will professional activity gravitate toward the preparatory, but execution vis-à-vis the nonprofessional environment will be mediated by computer action. The question of liability in tort and contract arises in this context, and this article cannot close without addressing it.

IV. LAW AND THE AUTOMATED BUSINESS

The question of who pays for faulty algorithmic actions has been discussed much in recent years, and the available responses can be categorized as follows: If the algorithmic action is understood as the act of an instrumentality, it can be treated either as within the responsibility of the human or corporate actor that uses it,[41] or in the alternative conceived as an actor in itself – perhaps as a corporation.[42] On the other hand, if the algorithmic process is treated as something transferred to a third party who is damaged or uses it to damage others, the process can be considered as either a product or a service – triggering the applicable rules for liability.[43] In any

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[39] Here, again, the system may learn new relationships, such as by including an analysis of newsfeeds to assess whether public sentiment or the public statements of a given regulator might be moving toward increased or decreased scrutiny of a given type of transaction.

[40] Lo, note 18, above, pp. 238-240; Aldridge and Krawciw, note 19, above, pp.51-52.

[41] This has been the standard practice for decades with algorithmic trading bots. *See* Joseph Lee, "Access to Finance for Artificial Intelligence Regulation in the Financial Services Industry" (2020) available at https://www.ssrn.com/abstract=3493423.

[42] *See* e.g., Shawn Bayern, "Are Autonomous Entities Possible?" 114 *Northwestern University Law Review* 23 (2019).

[43] *See* e.g., David C. Vladeck, "Machines Without Principals: Liability Rules and Artificial

case, existing theories of liability can be applied to hold the ultimate and intermediate actors liable, just as one might hold the driver, owner, mechanic and component manufacturers liable for the damages caused by a vehicle accident.

From the point of view of operating an organization using these automated processes, each of the potentially applicable theories of liability requires that the person in charge exercise reasonable diligence in an automated system's creation and application, as well as vigilant monitoring when it is being applied. The activity of the professional thus shifts from being personally immersive in the environment of his or her client, to stepping back into the role of an engineer who designs, builds and operates a machine that acts independently and must be supervised responsibly.

From a financial point of view, this mode of operation will require significant investment of time and resources prior to the operational stage of the business, which presents financial risk not found in a professional arrangement where the service-provider waits to act until the client has defined the problem to be solved – and perhaps paid in a retainer fee. This could have strong negative consequences for smaller and younger firms. On the other hand, if preparations are made for a product or service for which there is great demand, the automated system will be able to generate more business (read more documents, assemble more contracts, grant more loans, analyze more regulatory data) much faster than could spontaneously acting humans. Both the labor and risk profiles thus come to resemble manufacturing more than traditional "liberal profession" services.

V.　CONCLUSIONS

While banking can be thought to have left the realm of the "liberal professions" with the conversion of major investment banks from partnerships to corporations in the 1990s,[44] the practice of law still generally exhibits a human-centred organizational character, with practice areas clustered around senior partners and legal work delegated downward in line of seniority from these various human centers – the apexes of which dominate contact with clients. The data-driven "tech" suffix and the efficient automation it indicates is in the process of changing this, so that legal services – like financial services before them – are being clustered around profit centers supported by teams, data and machines.

As activities previously performed by human agents are automated, much of a firm's outward looking activity can be undertaken rapidly – almost instantly – by algorithmically guided systems acting on the basis of laboriously conceived and coded programs. For this reason, it appears that much of the professional staff engaged in financial institutions, law firms and regulators will move their focus upstream toward preparatory action – writing protocols and algorithms capable of analyzing and producing documents or triggering smart contracts. Such activity necessitates engaging staff capable of an abstract, almost academic, view of the processes involved in reaching a decision or executing a transaction relevant for the organization in question in order to construct models of application. Legal engineers will also be

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Intelligence," *Washington Law Review*, 89: 117 (2014).

[44]　*See* e.g. Rana Foroohar, *Makers and Takers: How Wall Street Destroyed Main Street* (Crown Publishing, 2016), p. 301.

necessary to build the models and write the programs necessary to translate the previously human analytical or operational activity into an automated process. Tertiary education should thus be able to provide the industries with people both knowledgeable about the research and contracting activity of the firm and creative enough to translate such activity into automated processes.

Lastly, as professional staff will inevitably be charged with supervising and adjusting automated processes, this staff should have a solid understanding of firm operations, the specific risks they present, and the agreed protocols to be executed in case of malfunction. This staff should also have sufficient creativity to design new products and services and be flexible enough to work with experts who are able to translate their concepts into working prototypes. This future is a long way from the hitherto existing prototype of liberal professions centered around wizened professionals, and can best be understood as a use of the best available tools to provide the financing, legal services or regulatory oversight sought by clients and the public. ♣

The Future of Constitutional Law
—*A German Perspective*

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作者資訊

ABSTRACT

While the German constitution – the Basic Law – can look back on an impressive success story, German constitutional law today faces a number of serious challenges. These challenges – and also future prospects – are described in the following article. Relevant topics are the increasing fragmentation and polarisation of politics challenging parliamentary democracy, the progressive centralisation of decision-making questioning federalism in Germany, the ambivalent tendency towards direct horizontal effects of fundamental rights and the crisis of the binding force of law in the European Union and in the global community.

🔍*Keywords: German Constitutional Law, Basic Law, Parliamentary Democracy, Federalism, Fundamental Rights, European Integration*

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The Future of Contract Law

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作者資訊

ABSTRACT

Modern contract law is marked by differentiation between types of contract. In the United Kingdom, housing contracts, employment contracts and particularly consumer contracts are now governed by specialist regimes. Many of the consumer measures derive from European Union legislation but UK consumer protection often goes further and the measures are expected to survive Brexit. We can expect more differentiation with further legislation to deal with new issues. The same is probably the case in almost all jurisdictions.

The general law of contract is thus effectively confined to contracts between businesses and between private individuals. But on many key issues the national laws of contract differ markedly, especially as between civil law countries and traditional common law jurisdictions such as England and Wales, Hong Kong and Singapore. Now that both digital products and services are being supplied on an international basis and now that small businesses and consumers make transnational contracts, the question arises whether we can expect further attempts to reduce the costs of transnational contracting, for example by more harmonisation measures; by the expansion or revision of the Vienna Convention on the International Sale of

Goods or the adoption of other "optional instruments"; or by "soft law" principles encouraging a gradual convergence. In Europe convergence is happening, but only between "like-minded" systems; on the key issues the English common law remains quite different. This is because typically English law is dealing with high value contracts made by sophisticated players, often operating in volatile markets. These parties can be expected to look after their own interests. Other jurisdictions deal more with small businesses making low value contracts, when more protective rules are appropriate. Thus we can expect continued divergence. Jurisdictions thinking of modernising their law should consider what type of case their law will most often have to handle.

🔍*Keywords: Contracts, Transnational Contracts, Harmonisation, Optional Instruments, Convergence*

CONTENTS

It is a great honour to be asked to contribute to the 300th issue of the Taiwan Law Review, and to be given the opportunity to speculate on the future of contract law. I will consider two issues: increasing differentiation between types of contract and differences between laws of contract.

I.   DIFFERENTIATION INTO SEPARATE LAWS OF CONTRACT

Every field of law is dynamic, and this is no less true of contract law than of other areas of law. We can see this if we look back at developments over the last half century. At least in my jurisdiction, England and Wales, we have seen enormous changes. Perhaps the most striking change is the differentiation between different types of contract. Although in principle all contracts are still governed by the same general legal rules, we have developed almost separate regimes for, for example, residential tenancies, employment contracts and consumer contracts. In some cases it is the courts which have developed rules applicable to only one type of contract, for example the term now implied into contracts of employment that the employer

International Judicial Cooperation in Criminal Matters
—*the European Path as a Model?*

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ABSTRACT

Criminal prosecution is faced with completely new challenges in the age of globalisation and digitisation. To overcome national borders, new solutions must be found that are nonetheless compatible with the rule of law. The European Union has based its judicial cooperation in criminal law on the principle of 'mutual recognition'. It has already adopted numerous important legal acts implementing this principle. The article focuses in particular on the European Arrest Warrant, the European Investigation Order and, in the area of 'e-evidence', the planned European Production and Preservation Order. The author not only describes the essential contents and advantages of these innovations, but also points out the problems arising from them. As a result, he believes that the principle of mutual recognition has an undeniable potential for improving judicial cooperation in criminal matters also for non-EU Member States seeking to support each other by providing legal assistance. Nevertheless, mutual recognition must be limited - in particular by inserting an ordre public-proviso for cases of serious fundamental rights violations.

⌕Keywords: *European Union, Mutual Recognition, Judicial cooperation, European Arrest Warrant, European Investigation Order, E-evidence, Fundamental Rights*