

The Law and political economy of decentralised digital ecosystems

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[https://urldefense.com/v3/https://www.palgrave.com/gp/book/9783030657802;!!DOxrgLBm!Tn8a5T8pimt7Q_bfB63j2B_4vB59OIKjNpToRhJWna-Gqop5BvgkeP7TETxRt4EdHittcRXiCuQ\\$](https://urldefense.com/v3/https://www.palgrave.com/gp/book/9783030657802;!!DOxrgLBm!Tn8a5T8pimt7Q_bfB63j2B_4vB59OIKjNpToRhJWna-Gqop5BvgkeP7TETxRt4EdHittcRXiCuQ$)

Where would you rather be, floating passively downstream on a platform to destinations unknown, or to be sailing your own boat, painting the landscape of your life?

The following chapter builds on and further develops some of the themes that were presented in my Public Lecture at the Riga Graduate School of Law on 18 December, 2018, and then in my panel intervention at the Harvard European Law Association's Spring Conference in March, 2019 at Harvard Law School on *Disruption, Innovation and the Future of Europe*. It has also been inspired by observations on the similarities and parallels between the political economy and law of decentralised digital ecosystems and the trading and cultural networks of ports, coastal cities and seafaring peoples such as the Hanseatic League, Venice¹, Greece and the Mediterranean: open, dynamic, innovative, connected, building various levels of governance, exchanging value and knowledge, finding agreements and creatively settling disputes.

The law and political economy of decentralised technologies could be described more as a philosophical or political concept than as a technical one or as a specified and limited group of existing or future technologies. What characterises and differentiates them from other technologies is that they are distributed and foster self-determination rather than being centralised, paternalistic or organised in a silo.

This is also a future proofed definition since the technologies themselves will develop further, progress or be replaced by others, but what should survive and flourish is this concept of individual or citizen-centricity, multi-level governance and democratic experimentation. The general principles of European (EU) Law themselves underline respect for, and the centrality of, the individual. "Because these rules of law, which permit regulation of the economy, directly affect individuals, the procedures must respect the position of the individual. Community law accordingly contains important principles protecting the individual."²

The governance tools of regulatory (and technical) sandboxes as instruments of regulatory innovation accompanying the proponents of new ideas align naturally with this technological and philosophical approach as well, though their application can be much broader. I have discussed this more encompassing vision in my article, "The Need for an Innovation Principle in Regulatory Impact Assessment: the Case of Finance and Innovation in Europe"³, so will not return to it here; other than to note its applicability to the overall

¹ "From humble origins, Venice had risen to true power. Poverty had been its spur, industriousness its secret. Its simple and ancient industries had developed and multiplied; its naval constructions had become extraordinary; its arsenal was unique." Brief History of Venice, Rinaldo Fulin, lineadaqua, June 2019, San Marco, Venezia, Italy p. 38-39.

² "Cases and materials on EU Law", Stephen Weatherill, Oxford University Press, Oxford, United Kingdom, 2006, p.58.

³ "The need for an Innovation Principle in Regulatory Impact Assessment:

innovation and data economy, of which decentralised digital technologies are an important and challenging (from the regulatory and supervisory point of view) subset. It is clear that many European Union economies could benefit from a larger number of innovations and that appropriate application and adaptation of the regulatory framework can enable such innovation while continuing to safeguard vital public interests.

In addition to the political imperative of holistic citizen-centric governance, innovation and creative destruction engendered by decentralised digital technologies reflect the renewal of dynamic capitalism, where incumbents are challenged, and adapt or fall into irrelevance, by new competitors proposing new business models or simply incremental improvements to what has been on the market. Joseph Schumpeter has written, “This process of Creative Destruction is the essential fact about capitalism. It is what capitalism consists in and what every capitalist concern has got to live in.”⁴

Little is permanent in market economics and this serves a practical purpose in the face of large dominant firms. Are the platform economy and its dominant platforms destined to rule the digital economy on into the foreseeable future or is change afoot?

Platforms are currently dominant in many parts of today’s economy and in the Digital Single Market. However, they are facing issues of data privacy, fake news, unfair trading practices, and consumer fatigue with some of their products. As Professors Ariel Ezrachi and Maurice E. Stucke have written, “could it be that, after the initial procompetitive promise, these technologies lead to higher prices, poorer quality, fewer options presented to us, and less innovation in things we care about, such as our privacy?”⁵

The rise of decentralised digital technologies: blockchain/distributed ledger technologies, artificial intelligence/collective intelligence, Internet of Things, Big Data, 3D printing and robotics, is a challenge in philosophy and approach to the centralised platform model of the Internet of today. These developments are related to, and also sometimes referred to as: convergence, Web3, protocols not platforms or as being part of the Next Generation Internet.

It is still an open question whether these developments will be good for competition and the consumer, or will simply serve as fodder for absorption by the same Platforms in M&A. As Ezrachi and Stucke wrote, “To cement its leadership, the super-platform may engage in the defensive practices of acquiring or blocking innovation or entry that might potentially undermine its dominance.”⁶ The moves of several of the biggest platforms to explore applications for payments or for decentralised social media on blockchains can be seen as part of their commitment to new types of innovation or as attempts to squelch future competition from new and dynamic actors in the market who could threaten their dominance of the sector.

Decentralised decision making

the Case of Finance and Innovation in Europe,” *Policy and Internet*, Wiley Periodicals, Malden, USA and Oxford, UK DOI: 10.1002/1944-2866.POI374, Volume 6, Issue 4, pages 377–392, December 2014.

⁴ “Can Capitalism Survive? Creative Destruction and the Future of the Global Economy”, originally published as “Capitalism, Socialism and Democracy” by Harper & Row, New York, 1942, p. 42-43.

⁵ “Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy”, published by Harvard University Press, Cambridge, Massachusetts, USA, and London, England, 2016, p.vii.

⁶ *Ibid*, p. 175.

Looking at the history of the development of the Internet, it could be deduced that decentralised decision-making was superior for enabling development compared to a centralised process, incorporating entrepreneurial actors with diverse perspectives. Many subcommittees and different actors contributed to building the Internet. The governance was grounded deeply in technical meritocracy and was inspired by the peer review system, and this was later formalised.

A rallying cry of today is ‘build protocols, not platforms⁷.’ However, it is interesting to note that while this vision is forward looking; at the same time, it harks back to the spirit and practices of the early Internet and to the innovation ecosystem that it spawned. In his article, “Protocols, Not Platforms: A Technological Approach to Free Speech”, subtitled, ‘Altering the Internet’s economic and digital infrastructure to promote free speech’, Mike Masnick writes, ‘To be clear, this is an approach that would bring us *back* to the way the internet used to be. The early internet involved many different protocols—instructions and standards that anyone could then use to build a compatible interface. Email used SMTP (Simple Mail Transfer Protocol). Chat was done over IRC (Internet Relay Chat). Usenet served as a distributed discussion system using NNTP (Network News Transfer Protocol). The World Wide Web itself was its own protocol: HyperText Transfer Protocol, or HTTP.⁸’

Further, he observes as I have above, ‘In the past few decades, however, rather than building new protocols, the internet has grown up around controlled platforms that are privately owned. These can function in ways that appear similar to the earlier protocols, but they are controlled by a single entity.⁹’

An analogy that can be found today is in the challenges and opportunities that we see in the development of the next generation of the Internet, the new data economy and the social and economic models that will make the green transition a reality. In addition to new economic opportunities based on disruptive innovation and more competition in the market, the new decentralised digital technologies being developed today can offer even more to science and to society, as I will detail below.

The decentralisation element is also important for the development and safety of artificial intelligence and other emerging technologies. “Just for pure computational reasons, making very advanced intelligence is going to involve making communities of intelligent systems because a community can see much more data than an individual system. If it’s all a question of seeing a lot of data, then we’re going to have to distribute that data across lots of different intelligent systems and have them communicate with one another so that between them, as a community, they can learn from a huge amount of data meaning that in the future, the community aspect of it is going to be essential.¹⁰”

⁷ “Protocols, Not Platforms: A Technological Approach to Free Speech.” By Mike Masnick, Knight First Amendment Institute at Columbia University, published 21 August 2019, <https://knightcolumbia.org/content/protocols-not-platforms-a-technological-approach-to-free-speech> , accessed on 16/03/2020.

⁸ Ibid

⁹ Ibid

¹⁰ Geoffrey Hinton, interviewed by Martin Ford in “Architects of Intelligence”, Packt Publishing, Birmingham, UK, 2018, p. 87-88.

Thinking about industrial policy and new technologies, another, and more European, example is that of Airbus. As Sarah Gordon wrote in the Financial Times, “Airbus’ success lies in its political roots.”¹¹ Impressive success was achieved by that bold initiative: within 25 years, Airbus had 50% of the global commercial air market and by 2003, it had become the largest supplier. It can be noted that it was a project that was engineering complex systems demanding low fault tolerance, and in that sense can be seen as instructive for token engineering. There are areas in which Europe can replicate this past success, FinTech and Blockchain, along with other DeepTech, particularly where the decentralised characteristic is present.

Trust

In addition to new economic opportunities based on disruptive innovation and more competition in the market, is there something more that these new decentralised digital technologies offer to society? John Authers wrote, “Trust then died with the credit crisis of 2008 and its aftermath. The sheer injustice of the ensuing government cuts and mass layoffs, which deepened inequality and left many behind while leaving perpetrators unpunished, ensured this.”¹² Into this environment of eroding trust came an unexpected innovation.

In 2008, Satoshi Nakamoto (an unknown person or group of people) published the White Paper for “Bitcoin: A Peer-to-Peer Electronic Cash System”¹³ It is a fully peer-to-peer system, doing away with any need for a trusted 3rd party, while eliminating the risk of double spending and immutably recording the transaction. The design was that the cryptocurrency Bitcoin functions on a blockchain. The practical application of Bitcoin was limited in scope and, in reality, it is functioning as a cryptoasset primarily for speculation, rather than as a currency.

While its proof of work was a groundbreaking and innovative, distributed approach in 2008, its energy consumption is hard to defend in 2020. The blockchain trilemma of self sufficiency, resource efficiency and no rent extraction provides a framework for reflection. Moving forward, we are able to evaluate a choice of alternative consensus mechanisms to proof of work, such as proof of stake.

The underlying technology has shown itself to be versatile and useful in many domains. Since that time, what could be called ‘blockchain inspired technologies’ have proliferated and overlap with digital ledger technologies, which, for most, they are a subset of, and variants like tangle, hashgraph and others.

The promise: Make your own revolution and cut out the middleman!

Blockchain is an innovative technology that enables both secure and transparent registers and data sharing. The potential use cases are in societal, economic and governmental contexts and could deliver benefits in terms of transparency, cost savings, efficiency, inclusion and security.

¹¹ “The European Model”, by Sarah Gordon, Special issue: Europe, the Financial Times Weekend Magazine, 24/25 May, 2014, p. 32

¹² John Authers, “Finance, the media and a breakdown of trust”, Financial Times, FT Weekend, 6 October/7 October 2018

¹³ <https://bitcoin.org/bitcoin.pdf>, accessed on 04/03/2020

If the technology does not utilise proof of work and mining, which on the other hand Bitcoin does, it can be very energy efficient, especially taking into account reduced downtime for maintenance. It has been successfully tested, in financial services, supply chain, trade finance, public services, regulatory reporting –RegTech, and more and more examples of deployment are arising daily.

What is rightfully disappearing is the type of irrational expectation that the technology is a magic cure for all problems, which it is clearly not. It has the most potential where a group of actors wish to share data and transfer value but cannot for legal (competition), political or other reasons share a single database while still having a desire to collaborate on specific operations.

The not very well founded assumption that blockchain technology would simply replace intermediaries, middlemen or governments entirely is a casualty of its collision with reality. It clearly has a lot of potential to disintermediate multiple, diverse processes and markets, but such transformation often require changes in legislation which foresees a certain role for an intermediary or in other cases changes in behaviour, business models or assumptions. On top of that, a peer to peer market or other collaborative mechanism must develop to link the different parties.

A blockchain technology can be at the heart of such markets or cooperation but the technology will not ensure them by itself. This realism is reflected in business models of the blockchain companies that have survived the hype cycle and that are developing workable solutions to address private sector and public sector use cases, including for infrastructures. This is seen as well in the programmes of startup conferences like TechChill¹⁴, in Riga, Latvia, in February 2020, that are focusing on these solutions and infrastructures, rather than on the ‘get rich quick’ scenario that was evident in much of the cryptocurrency discourse a year or so earlier.

Regulatory approaches to decentralised digital technologies

Preventing fragmentation, adopting standards, providing legal clarity and promoting public-private cooperation will help blockchain technologies flourish in the European Union and globally. Regulatory approaches should ideally unleash the potential of the private sector and societal actors to develop applications benefitting from peer-to-peer interactions. A set of actions in this direction have been undertaken, starting with the vision and policy.

The European Council (the Heads of State of the EU) recognised this already in October 2017, when they asked the European Commission to present a European approach to blockchain and invited the Commission to put forward initiatives for strengthening the framework conditions that enable the EU to explore new markets and to reaffirm the leading role of its industry.

¹⁴ Sessions like ‘Making Blockchain Work’ and ‘European Leadership in Blockchain: Innovation, Infrastructure and Regulation’ were featured in the second day, 21 February, which had a focus on blockchain: <https://techchill.co/agenda2020/>, accessed on 17/03/2020.

The European Commission followed soon afterwards with a policy initiative, the *FinTech Action Plan: For a more competitive and innovative European financial sector*¹⁵, in which the European Commission's follow-up to address a wide range of technological, organisational and regulatory issues related to technology-enable innovation was highlighted, including the use of blockchain in financial services. The Action Plan proposed a *FinTech Lab* where supervisors/regulators could be enlightened about new technologies by solution providers and to ask them hard questions, collaboration on *standards* (technical and regulatory), and a *European Blockchain Initiative*.

In regard to the latter, the Commission announced that that it intended to enable FinTech applications with the EU Blockchain Initiative, envisioning that Blockchain and distributed ledger technologies would most likely lead to breakthroughs transforming the way information and assets are exchanged, validated, shared and accessed through digital networks. It was envisioned that blockchain could become a central part of future financial services infrastructure, also connecting RegTech applications to eGovernment platforms.

Intensified cooperation between the financial services players, regulators/supervisors and innovators utilising approaches like regulatory sandboxes and innovation hubs was seen as beneficial for a rapid uptake and adoption of blockchain technologies in the financial sector. The utility of building an evidence base of where blockchain could produce the most tangible results was also underlined, following the supposition that blockchain/DLT are not a magic solution to all problems but a promising application for a number of broad coordination and collaboration challenges.

The EU Blockchain Initiative was comprised of the EU Blockchain Observatory and Forum, its working groups on legal issues and policy, and on use cases and transition scenarios; the European Blockchain Partnership, the European Blockchain Services Infrastructure, research and innovation funding in the areas of blockchain and DLT, assessment of legal frameworks, an equity investment fund for AI and blockchain, and a global stakeholders organisation – the International Association of Trusted Blockchain Applications (INATBA).

Moving from policy to implementation, the European Blockchain Partnership was founded at European Digital Day 2018, when 21 EU Member States and Norway signed the European Blockchain Partnership Declaration¹⁶, with the aim of creating a European Blockchain Services Infrastructure (EBSI). The EBSI aimed to support the delivery of cross-border digital public services, with the highest levels of security, privacy and sustainability. The Partnership grew to 30 countries, all 28 EU Member States, Norway and Liechtenstein, in 2019, but then stabilised to 29 countries, all 27 EU Member States, Norway and Liechtenstein, with the UK's withdrawal from the EU. The first use cases were confirmed by the European Blockchain Partnership in 2019 for launch in 2020 and were in the areas of regulatory reporting, audit publications and documents, diploma certification and self sovereign identity. It utilised funding from the Connecting Europe Facility (CEF).

¹⁵Brussels, 8.3.2018 COM(2018) 109 final, COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN CENTRAL BANK, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

¹⁶ <https://ec.europa.eu/digital-single-market/en/news/european-countries-join-blockchain-partnership> , accessed on 09/03/2020.

The example of the European Blockchain Services Infrastructure (EBSI) shows how the distributed nature of blockchain is particularly suited to the multi-level governance of the EU, with the possibility of introducing nodes at the EU, Member state, regional and municipal levels on a permissioned basis; concurrently, citizens could have a different level of access on a non-permissioned, but identified basis to benefit from public services or for transparency of governmental operations. This decentralisation aspect of blockchain offers a further possibility to ensure a citizen-centred and managed data society and economy, based on individual free choice and self-determination.

Moving from policy and implementation to the legal framework that can enable optimal uptake of the technology in the context of a values-based approach, what needs to be done? In terms of law and regulation, the major difference that can be found in addressing Blockchain, distributed ledger technologies and other decentralised digital technologies is precisely the decentralised characteristic. Much legislation in the EU has been adopted in the pre-digitalisation era or in that of data and platforms controlled and managed by a single entity.

Can, or how can, these frameworks be applied to the new decentralised digital technologies? In order to shape and adapt such new technologies in line with EU law and European values, the aforementioned regulatory sandboxes may be a useful tool. Regulatory sandboxes feature in both the aforementioned FinTech Action Plan and the European Commission's Startups to Scaleups Communication¹⁷ as an approach incorporating regulator/innovator collaboration in testing a new technology or business model that is not foreseen in existing legislation. There are interesting examples of regulatory sandboxes in the Netherlands, in the United Kingdom (the Financial Conduct Authority), Singapore, Taiwan, Lithuania and Denmark, with more under development in the European Union as well as in the rest of the world.

The European Blockchain Partnership can be seen as using this approach itself in the context of creating the European Blockchain Services Infrastructure, where legal frameworks and existing procedures must be applied to a novel technology: blockchain, in the course of creating this cross-border infrastructure and assessing regulatory initiatives that may need to be prepared in order to fully enable an innovation ecosystem utilising blockchain across all sectors in the EU. This is an approach that is worth exploring also in relation to the "convergence economy": not just blockchain/DLT but also their interaction with the Internet of Things (especially data coming from IoT), 3D printing, robotics, and Artificial Intelligence/machine learning.

Policymakers and legislators then face the question of whether the application of a regulatory sandbox approach is enough or specific legislation needed? There is always rightfully hesitancy to prepare legislation on a technology itself because of the principle of technology neutrality, i.e. we legislate on applications of a technology or to promote positive effects or to prevent impacts but not a regulation 'on servers' or 'on transistors' etc. However, the FinTech Action Plan launched a tech-review of financial services regulatory frameworks

¹⁷ COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS Europe's next leaders: the Start-up and Scale-up Initiative. Strasbourg, 22.11.2016 COM(2016) 733 final

in light of the new digital technologies and a Public consultation was announced by the European Commission from 19 December 2019 to 19 March 2020 on the EU Regulatory Framework for Crypto-Assets.¹⁸

Is something like a Digital Millennium Act or a ‘Safe Haven’ needed for decentralisation? The U.S. was successful in the Internet race, not only as a first mover with ARPANET, NSFNET etc. (there was, however, also the Minitel in France) but also by rapidly developing a holistic, proportionate and innovation enabling regulatory framework, exempting the Internet from telecoms and broadcasting requirements. It updated copyright and shielded Internet intermediaries from (copyright) liability.¹⁹ Considering that while the Internet resembled telecoms and broadcasting/publishing in some ways, it was also considered fundamentally different. It created legal certainty for the rise of the Internet and platforms, though in hindsight this approach may also have contained the seeds of some of the problems with fake news, unfair business practices and copyright infringement on the Internet that we see today.

Arguments have been made that blockchain, as a decentralised and disintermediated Internet of value can only thrive if policymakers, regulators and supervisors do not apply requirements to it that were designed for centralised models and intermediaries. The same could be said for decentralised machine learning, artificial intelligence, Internet of Things, 3D printing, robotics etc. However, this argument is taking a somewhat pessimistic view of the ability of the law to adapt and be flexible as times change, and new technologies replace older ones. It can also be observed that countries that have adopted blockchain/distributed ledger technology-specific legal regimes have been more those looking to attract more blockchain or crypto activity rather than those in which such economic or societal initiatives were already underway, and to which the existing legal framework was being applied to.

It may be moreover possible to deduce what the principles were behind the regulation of the centralised models were (protection of investors, of consumers, of the natural environment) and to apply them in a proportional manner to the new technology. Unless the law goes into exquisite detail, and thus risks to become obsolete as technology or business models develop, it will always have to be applied as economies progress, “But no matter how technically precise and careful, the law will always be subject to interpretation.”²⁰ Cecelia Watson further noted, “The law is skeletal, a mere naked framework of words, and those words require interpretation for the law to become animate and to act in the world²¹.”

Reflecting on a technical and specific legal aspect of blockchain, that of smart contracts, highlights some of the issues at stake, particularly in a cross-border context. It is expected that smart contracts utilised on blockchains can make a new automated and decentralised Internet infrastructure possible, concurrently enabling a decentralised economy based on automated execution and its related business models. A smart contract can be described as a piece of software that is stored and executed by the entire network in a decentralised manner. They make it possible to conduct a transaction online automatically, once the program has established that certain conditions that were set out earlier in the

¹⁸ <https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12089-Directive-regulation-establishing-a-European-framework-for-markets-in-crypto-assets/public-consultation> accessed on 09/03/2020.

¹⁹ <https://www.copyright.gov/legislation/dmca.pdf> accessed on 10/03/2020

²⁰ “Semicolon”, by Cecelia Watson, 4th ESTATE, London, UK, 2019, pp. 87-88.

²¹ Ibid, p. 88.

software code have been fulfilled. In the current legal situation, a smart contract may have legal significance, but this is necessarily so.

What are the legal issues that may need to be addressed in order to enable smart contracts while continuing to protect consumers? A question that has been raised is what is actually determinant: the intention with which a smart contract is drawn up or the way in which that intention is coded?

In regard to jurisdiction, it has been asked, if there is a dispute over a smart contract on a blockchain, particularly on a decentralised one, what is the applicable law and which court is competent? In regard to liability, if something goes wrong in the implementation of the contract, is this the responsibility of the programmer, of the party for whom the programmer worked, of the platform that provided the smart contract functionality?

Cross-border applicability, even in the EU, is an issue, “one specific aspect relating to the validity and enforcement of (smart) contracts is that of cross-border transactions, an element that is very important from a Digital Single Market perspective. Smart contracts are expected to be widely deployed in cross-border transactions, raising the question of whether a smart contract that is recognised in Member State A will also be recognised in Member State B. Our research has revealed that there can be scenarios where this is not necessarily the case, such as where jurisdiction A does not require that that particular contract be in writing but jurisdiction B does require semantic written contracts for that particular kind of contract²².”

Another area of legal discussion is that of data protection, and the General Data Protection Regulation²³ (GDPR) more specifically, and blockchain. The preparation of this and most privacy regulation took place in a context that was not one of disintermediated and decentralised technologies, but of centralised controllers and storage of data. It would be a pessimistic view of the law that would conclude that it cannot, or won't adapt.

A valuable contribution to this debate is the EU Blockchain Observatory and Forum's Report on Blockchain and the GDPR²⁴, which deduces that GDPR compliance is not about the technology, but about how the technology is used. Just as one cannot say that there is a GDPR Internet, or a GDPR-compliant artificial intelligence algorithm, one cannot say that there is a GDPR-compliant blockchain at the technology level. The report concludes that there are only use cases or applications that are GDPR-compliant (or not).

The tensions between GDPR compliance and blockchain revolve mainly around three issues: the identification, and obligations, of data controllers and processors, the anonymisation of personal data and the exercise of some data subject rights. To date, these issues have not been conclusively settled by data protection authorities, the European Data Protection Board or in courts, so it is an area where privacy by design and dialogue with the relevant supervisory authority are an important part of blockchain and other decentralised digital technology design. The upside is that decentralised digital technologies can evolve

²² “Study on Blockchains Legal, governance and interoperability aspects” (SMART 2018/0038), p. 117-118, <https://ec.europa.eu/digital-single-market/en/news/study-blockchains-legal-governance-and-interoperability-aspects-smart-20180038>, accessed on 27/03/2020.

²³ Regulation (EU) 2016/679 of the European Parliament and of the Council of 27 April 2016 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data, and repealing Directive 95/46/EC (General Data Protection Regulation)

²⁴ <https://www.eublockchainforum.eu/reports>, accessed on 11/03/2020.

ever more to become not just privacy compliant but privacy and self-determination enhancing technologies.

An example of such advances and ambitions can be found in the European Commission funded DECODE project: “Technological innovation is the core of DECODE: discover open source and privacy-enhancing tools that have been developed within the project. The decentralized DECODE stack includes a cryptographic virtual machine, a blockchain stack, a modular mobile app to access services privately, a dashboard for data visualization and a passport scanner²⁵.” The aim is to allow individual citizens to manage their own data, keeping it private, or donating it themselves to address societal challenges.

Another European Commission funded project *My Health, My Data* is in the vital area of sharing healthcare data on demand. It fostered individual citizen empowerment by, “Development of the **dynamic consent** interface, aimed at enabling data subjects to allow, refuse and withdraw access to their data according to different types of potential usage. Build-up of a **blockchain-based software infrastructure** in which individual data exchanges are governed by peer-to-peer relationships between all the stakeholders. Implementation of the **personal data account**, a personal cloud allowing data subjects for direct access to their whole clinical data from any personal device through the blockchain. Use of **smart contracts** to assist data subjects in their right to access, erase, modify delete or even ‘be forgotten’²⁶.”

An area of legal analysis and debate, which is also relevant is that of tokenisation on blockchains. Jamie Burke, CEO and Founder of Outlier Ventures has written, “Cryptographically secure and digitally scarce tokens are the magic sauce, or killer app, of the blockchain movement and represent a new wave of business model innovation. The ability to program both a hard cost and monetary incentive against user behaviors, directly into open source systems, transforms them from purely technical to socio-economic innovations²⁷.”

There was a big boom of Initial Coin Offerings (ICOs), a new fundraising or utilisation tool based on tokenisation on a blockchain, peaking in 2017-18 and raising billions of Euro. A division of types of tokens or “coins” could be into settlement tokens, currency and other assets; investments tokens, equity or debt; utility tokens, for enabling or consumer use; and donation tokens. Utility tokens are used to enable the use/consumption of services, usually in a decentralised system.

The EU Blockchain Observatory and Forum published a report on Blockchain and the Future of Digital Assets²⁸, which provides expert input on this subject. The FinTech Action Plan concluded that an assessment of the suitability of the current EU regulatory framework with regard to Initial Coin Offerings and cryptoassets more generally is necessary. This has been followed up with the aforementioned Public consultation was announced by the European Commission from 19 December 2019 to 19 March 2020 on the EU Regulatory Framework for Crypto-Assets.

²⁵ <https://decodeproject.eu/> accessed on 26/03/2020

²⁶ <http://www.myhealthmydata.eu/why-mhmd/> , accessed on 27/03/2020.

²⁷ “Token Ecosystem Creation: A strategic process to architect and engineer viable token economies”, <https://outlierventures.io/wp-content/uploads/2019/05/Token-Ecosystem-Creation-Outlier-Ventures-PDF.pdf> , accessed on 12/03/2020.

²⁸ <https://www.eublockchainforum.eu/reports>, accessed on 12/03/2020.

Self determination and data management

The issue that platform domination of digital markets raises for consumer choice and competition in the marketplace, but what is the impact of that dominant model on data and citizens' control over it? "Our information, the data, serves as a valuable commodity that translates into targeted advertisements, sales and money. Lots of money. It is therefore no surprise that companies are investing many resources into harvesting and analyzing such data, and many powerful tech firms, as we'll see, view privacy protection technologies as a threat. These trends create new gatekeepers and new forms of market power²⁹." The decentralised digital technology promise to reduce the market power of these gatekeepers and make individuals the gatekeepers and holders of market power themselves.

In the digital economy, access to data and control over data is vital. As Ezrachi and Stucke write, "if the critical resource at this point is data – not merely to target advertising, but also to optimize the products and services themselves – the firms with the most data are not merely in the best position to dominate their own sectors – they are also poised to take over adjacent fields³⁰." We see in the market, that moves are already foreseen from search or social media and advertising into mobility, payments, currency and the health sector, at scale. At the same time, barriers to entry into the market are very high for startups or SMEs that do not have access to that amount or even far lesser amounts of data. However, Ezrachi and Stucke note, "The real threat to the super-platform generally comes from innovation that disrupts the entire market.³¹"

J. Burke has also written, "we believe blockchain technologies, including distributed ledgers & smart contracts, are the mega-trend that allows all other macro-trends to scale securely, converge and combine. They represent the next phase of The Web, Web 3.0 or 'The Trust Web / Internet of Ownership' and will transform how technologies interact with one another and the World around them. Combined they enable a new more decentralised and automated Web infrastructure that brings with it previously impossible economic models. At their core, they represent a fundamental shift from centralized & human-mediated systems to trustless decentralized and autonomous networks.³²"

Decentralised citizen-centred management of data is identified as a potential opportunity in the European Commission's Communication on a European data strategy,³³ which states, "New decentralised digital technologies such as blockchain offer a further possibility for both individuals and companies to manage data flows and usage, based on individual free choice and self-determination. Such technologies will make dynamic data portability in real time possible for individuals and companies, along with various

²⁹ "Virtual Competition: The Promise and Perils of the Algorithm-Driven Economy", by Ariel Ezrachi and Maurice E. Stucke, published by Harvard University Press, Cambridge, Massachusetts, USA, and London, England, 2016, p. 28.

³⁰ Ibid, p. 31.

³¹ Ibid, p. 175.

³² "Blockchain-Enabled Convergence: Understanding the Web 3.0 Economy, by Outlier Ventures Research, <https://outlierventures.io/wp-content/uploads/2018/11/Blockchain-Enabled-Convergence-Whitepaper.pdf>, accessed on 17/03/2020.

³³ Brussels, 19.2.2020 COM(2020) 66 final COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, A European strategy for data.

compensation models.” The aforementioned European Commission Digital Strategy foresees the adoption of a Blockchain Strategy in the second quarter of 2020.

Elsewhere in the world, Dubai has announced that it is planning to launch ‘Decentralised Data for Dubai’³⁴, a programme that has announced that it will be setting up an open data ‘Sandbox’ built using a range of decentralised technologies from the Outlier Ventures ‘Convergence Stack’³⁵, potentially including blockchain-based companies like Sovrin, Ocean Protocol and Fetch.AI. They have foreseen laying the foundation for Dubai and its citizens to benefit from an open data explosion of innovation, which would be made accessible to a growing and increasingly diverse range of active participants in the city data market.³⁶

Dubai is not alone in moving into formal recognition of this decentralised model, but was daring in making this move early and at the scale of its whole jurisdiction. High potential for this type of approach exists globally, with one example being the citation above from the European data strategy. The scale of EU Member States and of the whole EU, as well as large economies of the world is of course potentially much greater. In the case of Europe, such an approach also recognises the multi-level governance of the EU in its decentralisation and provides great opportunities for private sector, bottom up innovation, putting the individual citizen and his or her concerns at the centre.

The aim would be to develop a system that puts individuals in control of their data, enabling them to share data securely across suppliers and services in different sectors on an informed basis, with blockchain being an enabling technology for implementation of this policy. It is necessary to underline that this needs to be a technologically neutral and innovatively open approach in that other types of distributed ledger technologies or other new or more appropriate tech would be used if shown to be better. However, the principle of decentralisation and individual and community empowerment should not be sacrificed on the altar of speed, which a centralised technology might offer.

Here the tools of smart contracts and tokenisation on a blockchain make possible this type of management of data with ease of use and minimal burden for the citizen. This technological approach opens up the possibilities of donation of data with recognition of ‘good deeds’, easy to use subscriptions and receiving compensation in diverse business models.

A goal would be to develop the possibility for dynamic portability of data in real time by individuals and thus make possible many business models serving both individual convenience as well as citizen-directed data sharing to meet societal goals such as the battle against climate change, to provide vital data to address pandemics or to provide relevant data for other medical research or public health goals.

³⁴ ‘Decentralised Data for Dubai Report’, published on 19 May 2019.
<https://www.smartdubai.ae/newsroom/news/decentralised-data-for-dubai-report> , accessed on 17/03/2020.

³⁵ <https://outlierventures.io/research/the-convergence-stack/> , accessed on 17/03/2020.

³⁶ Ibid

It is clear that such an approach will require much investment in technology, including in the ancillary measures needed in support, but given the needs for evidence-based decision making and implementation in these areas, it can be justified. In the case of the European Union, some part of this investment will come in relation to implementing the public sector use cases of the European Blockchain Services Infrastructure, coming from the Digital Europe Programme but much more investment will come from the private sector in anticipation of a strong return on investment from the individual-centric business models.

Conclusion

Increased levels of competition between enterprises in the economy to the benefit of consumers would be achieved and SME and startup activity would be encouraged by freeing up access to citizens' data, on their demand, which has been until now concentrated in several recognised and dominant silos. Looking forward to the convergence of artificial intelligence (AI), IoT, big data, 3D printing and blockchain in the next industrial revolution, this policy will foster the provision of many diverse, trustworthy, high quality, standardised, consented-to sets of data for the development of machine learning and trustworthy AI models.

A worthy aim is to forge a citizen-centred data economy, a market shaped by forward looking governments implementing legal frameworks enabling real time, effective portability of data and encouraging and benefitting from widely flourishing innovation bottom up. The utilisation of new decentralised technologies such as Blockchain and Distributed ledger technologies, employing applications such as smart contracts and tokenisation can be part of this solution providing real portability of data (social graph portability) at the request of the citizen/consumer in order to receive a better service, or to donate data in order to address a societal challenge. This is a necessity not just for the dynamism of economy but also for individual-based trusted societal initiatives free of manipulation and for the health of our media space and democracy.

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