

# **THE DECENTRALIZED LEGAL SYSTEM**

**The First Framework For Decentralized Law**

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## EXECUTIVE SUMMARY

In 2017, the world saw a dramatic increase in the use of Crypto-Currencies. Aside from their original use case for borderless transactions, a number of “*decentralized*” projects emerged focusing on the legal world. These projects can be divided into four main categories: Smart Contracts, Decentralized Jurisdictions, Decentralized Arbitration and Decentralized Companies. The main observation in this Whitepaper is that almost all of these projects lack a Legal Framework and therefore have little “force” in the real world. To resolve this issue, this paper presents the Decentralized Legal System, the first enforceable Legal Framework for Decentralized Legal Applications. In addition, this paper proposes an open source process for creating Decentralized Law, and envisions a world governed by Decentralized Law.

### Summary of Chapters

**Chapter one** explains that law and justice are somewhat fluid concepts and that their meaning changes over time. Law was first thought to be universal and imposed by a Creator. During the enlightenment era, the idea that rulers/governments alone impose law became more dominant. A number of developments however – both in theory and in practice – demonstrate that law making isn’t the sole domain of governments. This is especially apparent when we consider international and private law. The conclusion is that the law allows for decentralized innovation.

**Chapter two** explains what Decentralized Systems are. The origins, workings and use cases of Crypto-Currencies are described in detail, as well as the process that resulted in the development of Decentralized Legal Applications.

**Chapter three** discusses the legality of four specific categories of Decentralized Legal Applications:

- **Smart Contracts** have a wide range of possible applications. Their binary outcomes however restrict their use in the more fluid legal world. They should firstly be considered as technological innovations usable for relatively simple and repetitive tasks. Although they can be used in more complex situations, they need to be supplemented by a Human Language Contract and a Legal Framework.
- **Decentralized Jurisdictions.** Like many other aspects of our Legal System, the concept of jurisdiction relies on physical locations in the real world. By nature, a Decentralized System isn’t tied to a physical location. The only option left is to create jurisdictions by consensus.
- **Decentralized Arbitration,** as currently proposed, lacks a Legal Framework and force in the legal world. However, an enforceable framework for International Arbitration already exists and can be used for Decentralized Legal Applications.
- **Decentralized Companies.** Legal personality is essential to own property, engage in contracts or limit liability. Decentralized Corporations lack the Legal Framework needed to obtain legal personality. Decentralized Autonomous Organizations (DOA’s) do not remotely resemble legal persons. Both can therefore not be expected to perform many of the functions regularly attributed to them.

**Chapter four** summarizes the differences between the Crypto-Space and the Law. Legal Systems are based on ideas and best practices dating back thousands of years. They are subject to changing opinions and ideologies. Their definitions are debated and their outcomes are uncertain. Decentralized Technologies on the other hand, are based on hard sciences like mathematics and cryptography. These systems are both transparent and open source, and result in predictable outcomes. This discrepancy cannot be fixed by technological developments alone.

Furthermore, it is noted that many legal issues discussed in the Crypto-Space are in fact not new and that the law already provides a lot of room for innovation and bottom-up law creation. Moreover, decentralization appears to be a logical continuation of a the centuries-old process of dismantling power structures in favor of individual rights.

**Chapter five** presents Decentralized Legal Frameworks for the four categories of Decentralized Legal Applications mentioned in chapter two. Firstly, it proposes the creation of jurisdictions by consensus: so called Consensus Jurisdictions. It then explains a simple method for merging Decentralized Arbitration with existing International Arbitration frameworks. A Smart Contract Block is presented as a simple solution for merging Smart Contracts, Human Language Contracts and a Legal Framework. It continues by proposing two ways to register Decentralized Corporations so they can be recognized as legal entities.

**Chapter six** presents the Decentralized Legal System; a system not enforced by an individual or elite group of powerful individuals organized in a government, but accepted by a public and open source process. A system that exists in cyberspace, but has force in the real world. This framework can govern all four types of Legal Applications. Next, an open source process for developing decentralized governing laws is presented that is similar to Bitcoin Improvement Proposals. Four methods for publication and acceptance of Decentralized Law are then discussed after that. A Legal Wiki is presented as the ideal technology for publishing Decentralized Law, along with a rule-based algorithm for making amendments and keeping laws simple and understandable.

**Chapter seven** explains how Decentralized Law could govern the interaction of large groups people. The concept of Legal Reflexivity is introduced to explain how Decentralized Law could become an important foundation for Centralized Law. Finally, the idea of a world run by Decentralized Law is explored.

## Goal

The Decentralized Legal System merges revolutionary Decentralized Technologies with the tried and tested Legal System developed by trial and error over the last two millennia. It is in fact a workable new system grounded in the best of both worlds. This paper explains important concepts of law, and what Decentralized Systems and Decentralized Legal Applications are. The Decentralized Legal System is just a logical conclusion.

The Decentralized Legal System allows people to freely collaborate with the backing of an enforceable Legal Framework. This system is completely private and voluntary. It is the hope of the author that the theories discussed in this paper will be used as a framework for decentralized projects in the near future, and progress into other realms of governance as well. After the decentralization of money, the world is now ready for decentralizing law.

A number of important observations are included on the shortcomings of current Decentralized Legal Applications. Frameworks are suggested for their improvement. This should provide guidance for those working on the hundreds of projects in this area.

## Limitations

This Whitepaper is purely theoretical. The goal is to help the Crypto-Community. This is not an ICO. The ideas set forth in this paper will hopefully result in practical solutions and real-world applications.

Included are observations that could be considered critical towards current developments and beliefs in the Crypto-Community. This paper is not in any way a call to restrict decentralized developments by clinging on to what is “legal.” New technological developments will always be trailed by governing laws for the same reason that the car was created before a driver’s license was needed. This paper thus aims to explore the areas where Decentralized Law could flourish in short notice.

Many in the Crypto-Community are somewhat anarchistic in nature and reject the current Legal System with the idea of building something new. But when you reject the Legal System, you also reject its protection. This Whitepaper acknowledges the existing legal structure and its dependence on both governments and physical locations. However, like all other Decentralized Systems, it has the potential for innovation and disruption.

This paper is extensive, in some cases elaborating on basic concepts of either the law or Blockchain. This ensures that people with a legal background and those coming from the Crypto-Community, as well as the general public, are able to understand this paper.

## Acknowledgements

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## Table of Contents

<b>EXECUTIVE SUMMARY</b> .....	<b>1</b>
Summary of Chapters.....	1
Goal.....	3
Limitations.....	3
Acknowledgements.....	3
<b>CHAPTER 1 – THE LAW</b> .....	<b>5</b>
What Is Law?.....	5
Where Does Law Come From?.....	6
The State.....	7
Individual Rights.....	8
Natural Law vs. Positive Law.....	9
International Law.....	10
<b>CHAPTER 2 – DECENTRALIZED SYSTEMS</b> .....	<b>14</b>
What Makes Decentralized Crypto-Currencies Attractive?.....	14
Using The Blockchain For Other Applications.....	15
Programmable “Money”.....	16
<b>CHAPTER 3 – DECENTRALIZED LEGAL APPLICATIONS</b> .....	<b>17</b>
Category I – Smart Contracts.....	17
Category II – Decentralized Jurisdictions.....	20
Category III – Decentralized Arbitration.....	22
Category IV – Decentralized Companies.....	27
<b>CHAPTER 4 – DIFFERENCES AND OPPORTUNITIES</b> .....	<b>29</b>
Standing On The Shoulders Of The Law.....	30
<b>CHAPTER 5 – DECENTRALIZED LEGAL FRAMEWORKS</b> .....	<b>31</b>
Consensus Jurisdictions.....	31
Decentralized Arbitration Enforcement Framework.....	32
Smart Contract Blocks.....	33
Decentralized Corporation Nexus.....	35
Limited Liability And A DAO.....	36
<b>CHAPTER 6 – THE DECENTRALIZED LEGAL SYSTEM (DLS)</b> .....	<b>37</b>
Creating Decentralized Law.....	38
Publishing and Accepting Decentralized Law.....	40
Amending Decentralized Law.....	41
<b>CHAPTER 7 - A WORLD GOVERNED BY DECENTRALIZED LAW</b> .....	<b>42</b>
FIFA Law-Making.....	42
Legal Reflexivity.....	43
The Benefits Of Decentralized Law.....	43
The Future Of Law?.....	44

## CHAPTER 1 – THE LAW

*“...While lawyers and politicians celebrate the virtues of the rule of law, reformers lament its shortcomings, and cynics question its professed equivalence with justice. Yet all recognize the law as a vehicle for social change. And few doubt the central role of law in our social, political, moral, and economic life” - Raymond Wacks<sup>1</sup>*

### Are Crypto-Currencies “Legal?”

The legality of Crypto-Currencies is often questioned. Concerns range from the legitimacy of Crypto-Currency exchanges to new methods of crowd-funding called Initial Coin Offerings (ICO’s). Some call for governments to step in and regulate. Others reject all forms of governmental interference.

Crypto-Currencies are “decentralized.” They consist of a peer-to-peer network, have no central authority and are not bound to a single physical location. In addition, Crypto-Currencies rely on algorithms for their governance.<sup>2</sup> There seems little consensus on how to deal with all of this from a regulatory point of view. For now, each government treats Crypto-Currencies differently. So far, the only thing they are able to agree on is implementing Anti Money Laundering Regulations.<sup>3</sup>

This uncertainty is not necessarily a bad thing. After all, it opens the door for innovation. But before we can theorize how the law could interact with Crypto-Currencies, we must first understand what law is.

### What Is Law?

Over the centuries, philosophers and scholars have tried to define what law is and what justice means.

Plato wrote in the Dialogues of Gregorias<sup>4</sup> that in the arena of law and public affairs, it is rhetoric that deals with what is just and unjust. This inspired later scholars to identify law as a form of rhetoric.<sup>5</sup>

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1 Raymond Wacks, *The Philosophy of Law - A Very Short Introduction*, (Oxford University Press, 2006): Chapter xii

2 Andreas M. Antonopoulos, *Mastering Bitcoin - Programming the Open Blockchain* (O’Reilly Media, Inc, 2nd Edition, 2017): Introduction

3 Francisco Memoria, *Official: G20 Calls for Cryptocurrency Regulation Recommendations by July 2018*, CNN, (March 20, 2018), accessed March 29, 2018, <https://www.cnn.com/official-g20-calls-for-cryptocurrency-regulations-by-july-2018/>

4 Plato, *Plato in Twelve Volumes, Vol. 3*, translated by W.R.M. Lamb, (Cambridge, MA, Harvard University Press, London, 1967): 452e, *“I call it the ability to persuade with speeches either judges in the law courts or statesmen in the council-chamber or the commons in the Assembly or an audience at any other meeting that may be held on public affairs.”* 454b, *“Well then, I mean that kind of persuasion, Socrates, which you find in the law-courts and in any public gatherings, as in fact I said just now; and it deals with what is just and unjust.”*

5 James Boyd White, *Law as Rhetoric, Rhetoric as Law: The Arts of Cultural and Communal Life*, (The University of Chicago Law Review, Vol. 52, No. 3, Summer, 1985, pp. 684-702): 684:

*“A modern law school is, among other things, a school in those arts of persuasion about justice that are peculiar to, and peculiarly effective in, our legal culture.”* *“How can it be that law was ever regarded as anything but rhetoric?”*

The influential Italian enlightenment era legal scholar Cesare Beccaria observed that a Legal System doesn't change in a linear fashion over time. Instead, it is highly dependent on the “*passions and errors*” by which lawgivers are influenced.<sup>6</sup>

In 2010 Tom Bingham published his book *The Rule of Law*.<sup>7</sup> One of the most distinguished judges in the UK, in the book he makes some humbling statements in the book when defining its title. He states: “*everyone is for it, but have contrasting convictions about what it is.*” And even while judges refer to the term in their rulings and in their speeches, there is no universally accepted definition of the rule of law. However, he adds that: “*there is a strong international consensus that the rule of law is a meaningful concept, and a rather important one at that.*”

**We can conclude that legal scholars over time have demonstrated that law and justice are somewhat fluid concepts and that their meanings change over time.**

This fickleness of the law is demonstrated by a study from Israel on how the eating habits of experienced judges influenced their decisions on parole requests. During the study, cases reviewed just before lunchtime had a near 0% chance of receiving a favorable ruling. Cases reviewed just after lunch however, had a 65% chance of receiving a favorable ruling.<sup>8</sup>

With such foundations and outcomes, the legal world appears very different from the hard sciences, math-based algorithms and cryptography that form the foundations for Crypto-Currencies. But why is this?

## Where Does Law Come From?

The origins of what we consider law can be traced back all the way to Ancient Greeks philosophers like Aristotle and Roman Philosophers like Cicero. They noted that certain behaviors are universal and that they display a shared fundamental humanity. In addition, there is no culture so backwards, remote or back in time that such behaviors cannot be observed at first inspection.<sup>9</sup>

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6 Cesare Bonesana-Beccaria, Marquis of Gualdrasco and Villareggio, “*An Essay On Crimes And Punishments*,” translated from the Italian, with commentary attributed to De Mons. Voltaire, translated from the French, (Printed for F. Newbery, at the Corner of St. Paul's at the Church-Yard, London, 1775.): 24, “*Whoever reads, with a philosophic eye, the history of nations, and their laws, will generally find, that the ideas of virtue and vice, of a good or a bad citizen, change with the revolution of ages; not in proportion to the alteration of circumstances, and consequently the common good; but in proportion to the passions and errors by which the different law-givers were successively influenced.*”

7 Tom Bingham, “*The Rule of Law*,” (Penguin UK, Reprint edition, London, 2011): Chapter 1 - The Importance of the Rule of Law, accessed on Amazon Kindle.

8 Shai Danziger, Jonathan Levav and Liora Avnaim-Pesso, “*Extraneous Factors In Judicial Decisions*,” PNAS, vol. 108 no. 17 (April 26, 2011): 6889-6892, <https://doi.org/10.1073/pnas.1018033108>. “*We find that the percentage of favorable rulings drops gradually from ≈ 65% to nearly zero within each decision session and returns abruptly to ≈65% after a break. Our findings suggest that judicial rulings can be swayed by extraneous variables that should have no bearing on legal decisions.*”

9 Daniel N. Robinson, “*The Great Ideas of Philosophy*,” 2nd Edition, (The Teaching Company, 2004): Lecture 17. *Roman Law-Making a City of the Once-Wide World.*

They advocated the use of reason to analyze human nature to deduce binding rules of moral behavior instilled by God. Cicero said:

*“Law is highest reason, implanted in nature... Surely nothing is preferable to the plain understanding that we have been born for justice and that right has been established not by opinion but by nature.”*<sup>10</sup>

These principles are known as *natural law* and formed the foundation of the Roman Legal System. The empire was governed not by the passions of warlords, but by a predictable system based on solid principles founded by reason.<sup>11</sup> In addition, it created the first example of codification- the numbering system now commonly used in legislation. More over, the Romans initiated the form of top-down law making that is now used all over the world.

The Romans also created the distinction between Public Law – governing the relationship between individuals and the State – and Private Law – governing relationships between individuals. This distinction becomes important later in this paper, because it is in the area of Private Law that the first steps toward Decentralized Law can be made.

Emperor Justinian I was a key figure in the conservation of Roman Law over the ages. He ordered the collection of Roman Law in a body of law known as the *Corpus Juris Civilis*. These works were highly influential for early European legislators.<sup>12</sup>

In short, what we now know as law has a Greek philosophical foundation built upon by Roman legislators and lawyers.<sup>13</sup> The dark ages however then suppressed these principles for centuries.

## The State

With Rome in ruins, the ideas of a codified body of law were discarded. Kings ruled medieval Europe. They claimed God-given rights to govern the lands they considered their property. A growing discontent amongst the English nobility made way for The Magna Carta, a series of developments that then led to the first major limitations of the universal rights of kings in 1215. From then on, the king was (somewhat) restricted in his actions by the law.<sup>14</sup>

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10 Marcus Tullius Cicero, *On the Laws*, Translated by David Fott. Ithaca, (Cornell University Press, New York, 2014): Books 1 and 3, accessed on 30 January 2018, <http://www.nlnrac.org/classical/cicero/documents/de-legibus>

11 Daniel N. Robinson, “*The Great Ideas of Philosophy*”: Lecture 17

12 Timothy G. Kearley, *The Creation and Transmission of Justinian’s Novels*, (Law Library Journal, Vol. 102:3, 2010), accessed on March 30, 2018, <http://www.uwyo.edu/lawlib/blume-justinian/ajc-edition-2/novels/index.html>. Page 378:

“In 528, the emperor Justinian appointed a commission to compile and harmonize the imperial enactments (constitutiones, or constitutions) of previous emperors.” Page 377: These novels were “passed along during the Middle Ages and the Renaissance,” “...the Continent was necessarily the locus of research on the subject. Most of the ancient manuscripts were there, and their national legal systems were based on, and still looked to, Roman law.”

13 Daniel N. Robinson, “*The Great Ideas of Philosophy*”: Lecture 17

14 David Carpenter, “*Magna Carta - with a new commentary by David Carpenter*,” (Penguin Classics, 2015): Chapter 8, Standards of Judgement. “John claimed throughout the Charter that the kingdom was ‘his’ kingdom. Indeed that seemed inherent in the very word ‘kingdom’. Yet the Charter testified powerfully to the view that the kingdom had been harmed by the king and was now extracting the much needed ‘reform’ – ‘emendatio’ – from him.”

Besides Kings, medieval Europe knew other power structures including the unity of Christianity under the Pope and Emperors like the House of Hapsburg. International relations were not based on equally distributed power, either in fact or in theory. Power resided with the strongest party.<sup>15</sup>

These power struggles reached their pinnacle during a destructive period of conflict known as the 30 Years' War. This war and its leading causes were addressed with a series of peace treaties signed between May and October 1648 in the Westphalian cities of Osnabrück and Münster<sup>16</sup>

As Hassan (2006) in his study on Territorial States summarizes:

*"The Westphalia settlement emphasised the separation and equality of states rather than the unity of Christendom. It rejected any idea that the Pope or Emperor had any universal authority. The Westphalia settlement established the anti-hegemonic concepts of territorial sovereignty and sovereign equality."*<sup>17</sup>

The modern nation state was thus born. This concept quickly spread around the world and remains in use to this day. However, the powers of the various rulers of these States were largely unchallenged by this settlement.

## Individual Rights

From the 18<sup>th</sup> century, concepts of individual liberty started to really gain popularity thanks to enlightenment thinkers like John Locke. He wrote an influential book that strongly argued against the concept of God-given rights for royalty and in favor of individual liberty.<sup>18</sup>

Such writing inspired the American Founding Fathers including Thomas Jefferson<sup>19</sup> to create important documents for the establishment of individual rights, like the Declaration of Independence and Bill of Rights.

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15 Daud Hassan, "The Rise of the Territorial State and The Treaty Of Westphalia," (Yearbook of New Zealand Jurisprudence, Vol 9, 2006), accessed April 5, 2018,

<https://opus.lib.uts.edu.au/bitstream/10453/3289/1/2006006060.pdf>: Page 66

16 "Peace of Westphalia," (Wikipedia), [https://en.wikipedia.org/wiki/Peace\\_of\\_Westphalia](https://en.wikipedia.org/wiki/Peace_of_Westphalia)

17 Daud Hassan, "The Rise of the Territorial State and The Treaty Of Westphalia": Page 65

18 John Locke, "Two treatises of government," (Printed for Thomas Tegg; W. Sharpe and Son; G. Offor; G. and J. Robinson; J. Evans and Co.: Also R. Griffin and Co. Glasgow; and J. Gunning, Dublin; London, 1823): Chapter 2, §6. "Sir Robert Filmer's great position is, that 'men are not naturally free' This is the foundation on which his absolute monarchy stands, and from which it erects itself to an height, that its power is above every power: caput inter nubilia, so high above all earthly and human things, that thought can scarce reach it; that promises and oaths, which tie the infinite Deity, cannot confine it. But if this foundation fails, all his fabric falls with it, and governments must be left again to the old way of being made by contrivance and the consent of men."

19 John B. Boiles, "Jefferson - Architect of American Liberty," (Basic Books, New York, 2017): Chapter 5, Pen Of The American Revolution. "Jefferson was a student of political philosophy and legal history, and for him, as for many of the delegates, the basic ideas of John Locke, Algernon Sidney, John Trenchard and Thomas Gordon (authors of the essays in Cato's Letters), and other writers were ingrained in his mind."

When reading the Declaration of Independence<sup>20</sup> (and its Dutch precursor<sup>21</sup> and French successor<sup>22</sup>) one could argue that they were not establishing the rights of individuals. Rather, they intended to limit the power of the rulers!

Eventually, the US was established as a new idea under a complete new set of rules establishing “unalienable rights” based on natural law. Unlike its European counterparts, the US did not have a king. Instead, the law was king.<sup>23</sup> It was a unique achievement that changed history. The long road of unalienable rights however reached its pinnacle shortly after World War II, with the acceptance of the United Nations of the Universal Declaration of Human Rights.<sup>24</sup> However, these aren’t the only influential ideas for law.

## Natural Law vs. Positive Law

During the era of enlightenment, the notion of God-given rights was also challenged in other ways. Some argued that humans alone constructed laws and that they were enforced by the government. This became known as Legal Positivism.

The United States Code sums up the difference between natural and positive law:

*“Positive law is made by people. Natural law comes from sources that are universal. To many people (for example, to Thomas Jefferson in the Declaration of Independence) the source of natural law is God. Natural law is universal; it applies to everyone. Positive law only applies to those people who are the subjects or citizens of the government that creates the law. Positive law must be written down. Natural laws are unwritten laws. In short, then, positive law must be made by a given government and it relies on the government for its power.”<sup>25</sup>*

John Austin was an important Legal Positivist in the 19<sup>th</sup> century. He wanted to transform law into a true science. To do this, he believed it was necessary to purge human law of all moralistic notions and to define key legal concepts in strictly empirical terms. He thought that law reflects relations of *power* and *obedience* between a sovereign and its subjects.<sup>26</sup>

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20 Thomas Jefferson et al., “*The Declaration of Independence - The Unanimous Declaration of the thirteen united States of America*,” (Action of Second Continental Congress, July 4, 1776):

- “We hold these Truths to be self-evident, that all Men are created equal, that they are endowed by their Creator with certain unalienable Rights, that among these are Life, Liberty, and the pursuit of Happiness.”
- “But when a long Train of Abuses and Usurpations, pursuing invariably the same Object, evinces a design to reduce them under absolute Despotism, it is their Right, it is their Duty, to throw off such Government.”

21 “Act of Abjuration / Plakkaat van Verlattinghe” (Wikipedia) [https://en.wikipedia.org/wiki/Act\\_of\\_Abjuration](https://en.wikipedia.org/wiki/Act_of_Abjuration)

22 Gilbert du Motier, Marquis de Lafayette et al., “*Declaration des droits de l'homme et du citoyen*,” (Approved by the National Assembly of France, August 26, 1789): “The representatives of the French people, organized as a National Assembly, believing that the ignorance, neglect, or contempt of the rights of man are the sole cause of public calamities and of the corruption of governments.”

23 Thomas Paine, “*Common Sense*,” (1776): “...let a crown be placed thereon, by which the world may know, that so far as we approve as monarchy, that in America THE LAW IS KING.”

24 United Nations, “[Universal Declaration of Human Rights](#)”

25 “THE TERM ‘POSITIVE LAW’,” United States Code, Office of the Law Revision Counsel, accessed on March 15, 2018, [http://uscode.house.gov/codification/term\\_positive\\_law.htm](http://uscode.house.gov/codification/term_positive_law.htm)

26 John Austin, “*The Province of Jurisprudence Determined*,” 1832, accessed March 30, 2018, <http://www.nlnrac.org/node/255>

- Page 2 “...the aggregate of the rules, established by political superiors, is frequently styled positive law, or law existing by position.”

H.L.A. Hart was another major contributor to Legal Positivism in the 20<sup>th</sup> century. However, he refuted the idea that law strictly exists because due to coercion.<sup>27</sup> This came as he believed that there are also forms of law *created by individuals to empower themselves*, such as contracts and wills.<sup>28</sup>

During the 80s and 90s Ronald Dworkin came up with an even stronger critique of Legal Positivism. He argued that law is not only deducted from cold hard legislation; rather that it requires that judges come up with the best constructive interpretation of the political structure and legal doctrine of their community. In short: a moral stance must be taken.<sup>29</sup> Adding such subjectivity to the theory of law added significant cracks to the proposed scientific foundation as argued by Austin and early Positivists.

However, the idea that law is government-made and enforced is still widely held. But is law making really the monopoly of governments?

## International Law

We saw that the concepts of law are fluid. This becomes even clearer when studying International Law. The origins of International Law have generally been attributed to Grotius (Hugo de Groot) and Gentili. These early forms of International Law were mainly to regulate the interactions between nations at war.<sup>30</sup>

Over the years, developments like international trade, economic cooperation, wars and subsequent peace treaties and many multinational governing bodies have led to what is known as International Law. It can be described as follows:

*“...the body of rules and principles that determine the rights and duties of states, primarily in respect of their dealings with other states and the citizens of other states, determine what is a state and within what geographical territory they exist.”*

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- Page 3 “Every law or rule ... is a command.”
  - Page 7 “Laws and other commands are said to proceed from superiors, and to bind or oblige inferiors.”

27 Raymond Wacks, “*The Philosophy of Law - A Very Short Introduction*”: Page 27 “Hart’s positivism is a far cry from the largely coercive picture of law painted by Bentham and Austin.”

28 Robert S. Summers, “Professor H.L.A. Hart’s Concept of Law,” (Duke Law Journal, vol.1963, no.4): 633

“For Professor Hart, perhaps the most significant differences between legal rules and orders are these: (1) orders direct people to do or refrain from action, but many legal rules do not do this-instead they empower people to act in various ways, e.g., to legislate, to make wills and to make contracts;”

29 Allan, Dworking and Dicey: The Rule Of Law As Integrity, (Oxford Journal of Legal Studies, Volume 8, Issue 2, 1 July, 1988), Pages 266–277, accessed on March 30, 2018, <https://doi.org/10.1093/ojls/8.2.266>

“Fairness requires a political structure which distributes power correctly. Justice requires a morally acceptable distribution of material resources and the protection of civil liberties. In ordinary politics if not in Utopian theory, however, justice and fairness often conflict. We must therefore embrace integrity as a distinct political ideal which may itself conflict with both justice and fairness. Integrity assumes an (essentially metaphorical) personification of the state, which is to be treated as a moral agent.”

30 Tom Bingham, “*The Rule of Law*”: Chapter 2 - Some History, Part 11: War.

“Under the influence of writers such as Gentili (1552-1608) and Grotius (1583-1645) a body of customary International Law began to grow up, fed by sources such as the 150 Articles of War signed by Gustavus Adolphus II of Sweden in 1621 and deriving its authority from the practice of the nations, regards by them as a matter of obligation.”

31 Vaughan Lowe, “*International Law (Clarendon Law Series)*,” (Oxford University Press, 1th edition, November 17, 2007): Chapter 1.2, “*The Scope and Nature Of International Law*”

## How is International Law created?

No central authority exists to enforce International Law. There is no constitution and no world government that creates it. Article 38 of the charter of the International Court of Justice in The Hague<sup>32</sup> defines three main ways of creating International Law:

- A) *International conventions, whether general or particular, establishing rules expressly recognized by the contested states.*
- B) *International custom, as evidence of a general practice accepted as law.*
- C) *The general principles of law recognized by civilized nations.*

The first method is straightforward. States sign treaties with one or multiple other states. This creates a body of law that governs their interactions.

However, the second and third methods involve the words “accepted” and “recognized” respectively. This implies that International Law is accepted over time due to consensus. When a certain practice has been a custom over time, or once it becomes a general principle of law, it gradually establishes itself as International Law.

There are a lot of famous organizations that influence International Law, such as the United Nations and the European Union. There are also other organizations that focus on specific areas of economic cooperation, including the World Trade Organization and the International Maritime Organization. Next, there are international conventions that establish universal rules, like the Geneva Convention on the Treatment of Prisoners of War.<sup>33</sup> And finally, there are rulings from International Courts.

Despite its somewhat opaque origins, International Law is very influential. Vaughan Lowe (2007) writes in his book on International Law:

*“International Law has no legislature. Nor is there a police force, or even a compulsory system of court before which States can be compelled to appear. Nevertheless, most States comply with most of the rule of International Law most of the time.”*<sup>34</sup>

Why is this? Most International Law is based on treaties signed by countries and customs of these countries. They comply with International Law because they make the rules to suit themselves. It is of course in their interest to be seen as trustworthy partners. At the same time, it offers tools to control countries that step out of line.<sup>35</sup>

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32 “Statute Of The International Court Of Justice,” Charter of the United Nations, accessed on March 31, 2018, [http://legal.un.org/a/vl/pdf/ha/sicj/icj\\_statute\\_e.pdf](http://legal.un.org/a/vl/pdf/ha/sicj/icj_statute_e.pdf)

33 United Nations, III GENEVA CONVENTION RELATIVE TO THE TREATMENT OF PRISONERS OF WAR OF 12 AUGUST 1949,” (Geneva, August 12, 1949), [https://www.un.org/en/genocideprevention/documents/atrocities-crimes/Doc.32\\_GC-III-EN.pdf](https://www.un.org/en/genocideprevention/documents/atrocities-crimes/Doc.32_GC-III-EN.pdf)

34 Vaughan Lowe, “International Law,” Chapter 1,6

35 Vaughan Lowe, “International Law,” Chapter 1.6, “One powerful reason why States do, and always have, complied with International Law is, therefore, that they make the rules to suit them. International Law constrains errant States, which seek to break away from established patterns of behaviour or to abandon treaty commitments that they have made.”

## International Law vs Private Affairs

We saw that International Law determines “*the rights and duties of states.*” We can add that it governs all activities of public authorities that involve a foreign element, including foreign citizens.<sup>36</sup> This implies that International Law does apply to the dealings of individuals, but only as far as they involve a State.

However, there are developments in the creation, enforcement and reach of International Law – that are also highly influential on the Crypto-Space – that tell us otherwise. This becomes clear when we look at the actions of organizations such as the Financial Action Task Force on Money Laundering (FATF) and the Organisation for Economic Co-operation and Development (OECD). These organizations form a foundation for a multinational approach to combat money laundering<sup>37</sup> and tax evasion.<sup>38</sup>

As discussed, these organizations are not considered States and don't have the power to enforce law. Instead, they create “recommendations.” Countries can choose to accept these recommendations by incorporating them in their national legislation, or ignore them. In practice, they have no choice but to accept. If not, they could end up on a blacklist of “non-cooperative jurisdictions” and risk getting cut off from the global financial system.<sup>39</sup>

In practice, these organizations regulate (and in many cases restrict) the interaction between individuals and private organizations. These developments alter the basic concept of International Law because they are neither based on treaties nor acceptance. They are forced, and expand the scope of International Law by targeting private parties.

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36 Vaughan Lowe, “*International Law*,” Chapter 1.5,

“*International Law governs all activities of states that involve a foreign element: that is to say, all dealings by public authorities with foreign States or foreign citizens or with matters outside the borders of the State.*”

37 “*What we do*,” FATF, accessed on April 3, 2018, <http://www.fatf-gafi.org/about/whatwedo/>:

“*The Financial Action Task Force (FATF) was established in July 1989 by a Group of Seven (G-7) Summit in Paris, initially to examine and develop measures to combat money laundering.*”

38 “*Standard for Automatic Exchange of Financial Account Information in Tax Matters, Second Edition*,” OECD, accessed on April 3, 2018, <https://www.oecd.org/tax/exchange-of-tax-information/standard-for-automatic-exchange-of-financial-account-information-in-tax-matters-second-edition-9789264267992-en.htm>

“*The Standard draws extensively on earlier work of the OECD in the area of automatic exchange of information. It incorporates progress made within the European Union, as well as global anti-money laundering standards (editor: FATF), with the intergovernmental implementation of the Foreign Account Tax Compliance Act (FATCA) having acted as a catalyst for the move towards automatic exchange of information in a multilateral context.*”

39 “*High-risk and other monitored jurisdictions*,” FATF, accessed April 3, 2018, <http://www.fatf-gafi.org/publications/high-riskandnon-cooperativejurisdictions/>

## Summary of International Law

One could argue that International Law is already decentralized by nature. It requires no central authority to be effective. This also means that International Law, for the most part, is followed *voluntarily*. If such a system can exist on such a large scale, it surely can exist on a smaller one too.

Most importantly, the creation of contemporary International Law already happens in large part outside the (direct) control of national governments. This leads to an important conclusion:

**There apparently is no need for the involvement of national governments to create law. Once a piece of legislation or a practice becomes accepted and recognized, it eventually becomes part of International Law, one of the highest and most influential forms of law in existence.**

Given that an unelected group of people can create worldwide-accepted regulations based on their interpretation of reality, why can't the Crypto-Community itself create the rules that govern its interactions?

This question is answered in the following chapters.

## CHAPTER 2 – DECENTRALIZED SYSTEMS

*“We have it in our power to begin the world over again.” - Thomas Paine<sup>40</sup>*

The Whitepaper that introduced Bitcoin, published in 2009 by Satoshi Nakamoto<sup>41</sup>, set off a chain of events that sent ripples of excitement around the world. Even though Bitcoin is firstly a Crypto-Currency, many people quickly understood the impact that Decentralized Systems could have on all aspects of our lives.

Bitcoin did not simply fall from the sky. In fact, there had already been earlier ideas on the use of cryptography to create Decentralized Systems.<sup>42</sup> These technologies and the science behind them have anarchistic origins.<sup>43</sup> A group known as “Cyberpunks” explored cyberspace and its technological opportunities for decades in the hope of creating a world with renewed freedoms.<sup>44</sup>

The first ever block of the Bitcoin Blockchain, known as the Genesis Block, was mined at the height of the financial crisis. Some people within the Crypto-Community interpret the timing and the text added as a challenge to the centralized authorities issuing *currencies*<sup>45</sup>:

*“The Times 03/Jan/2009 Chancellor on brink of second bailout for banks”<sup>46</sup>*

### What Makes Decentralized Crypto-Currencies Attractive?

To answer this question, it is important to define what a Crypto-Currency is:

*“...any form of currency that only exists digitally, that usually has no central issuing or regulating authority but instead uses a decentralized system to record transactions and manage the issuance of new units, and that relies on cryptography to prevent counterfeiting and fraudulent transactions.”<sup>47</sup>*

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40 Thomas Paine, “*Birthday of a New World*,” 1776

41 Satoshi Nakamoto, “*Bitcoin: A Peer-to-Peer Electronic Cash System*,” 2009, accessed on March 2, 2018, <https://bitcoin.org/bitcoin.pdf>

42 Nakamoto (2009), 9. References used in the original Whitepaper provide insight in the building blocks of Bitcoin.

43 W. Dai, “b-money,” <http://www.weidai.com/bmoney.txt>, 1998.

“I am fascinated by Tim May's crypto-anarchy. Unlike the communities traditionally associated with the word “anarchy”, in a crypto-anarchy the government is not temporarily destroyed but permanently forbidden and permanently unnecessary.”

44 Christian As. Kirtchev, “*A Cyberpunk Manifesto*,” (The Cyberpunk Project, February 14, 1997), accessed on April 3, 2018, [http://project.cyberpunk.ru/idb/cyberpunk\\_manifesto.html](http://project.cyberpunk.ru/idb/cyberpunk_manifesto.html)

45 Murray N. Rothbard, “*What Has Government Done to Our Money?*,” (Mises Institute, Alabama, 2008), <https://mises.org/library/what-has-government-done-our-money>

In this book, the author argues that the money that our a government issues is not money, but fiat currency.

46 “*Genesis block*,” Bitcoinwiki, accessed April 3, 2018, [https://en.bitcoin.it/wiki/Genesis\\_block](https://en.bitcoin.it/wiki/Genesis_block)

47 “*Definition of CRYPTOCURRENCY*,” Merriam Webster Dictionary, accessed on April 3, 2018, <https://www.merriam-webster.com/dictionary/cryptocurrency>

At its core, this technology provides trust. Participants in the network can trust that the currency they receive is real. They can trust that their currency can only be spent once. If a payment has been made, it has been paid irrevocably. Moreover, there is no way that anyone can interfere in the transaction, reverse it or have a claim on the same currency.<sup>48</sup>

Another important feature is decentralization. Taking Bitcoin as an example, there are developers, miners and users who influence the use and development of the system. Yet, no single person or group of persons controls the system. In addition, it is a peer-to-peer network, meaning anyone with an Internet connection can join it. With Bitcoin, you can send payments to the other side of the world, which, once confirmed by the network, are irrevocable.

A Crypto-Currency transaction cannot be compared to a traditional bank transaction. They are fundamentally different. Crypto-Currency transactions are added to blocks in a Blockchain. This Blockchain contains information on all the transactions that ever happened from beginning to end. It acts as a public ledger holding many synchronized copies distributed around the world. No single person or group can tamper with the ledger. The ledger keeps a full-proof record of who owns what.

Bitcoin's high level of security comes thanks to cryptography. Its network is secured by SHA-2, an unbreakable set of cryptographic hash functions designed by the United States National Security Agency (NSA).<sup>49</sup> This ensures that access to the technology cannot be restricted and regulatory tools cannot be enforced. Attempts at regulation can therefore only focus on the *users* of the technology, and not on the technology itself. This is just like other Decentralized Technologies that proved to be unstoppable, such as the file-sharing protocol BitTorrent.<sup>50</sup> In popular terms, the genie is out of the bottle.

It is a system based on mathematics and unbreakable code. And it is beyond theory. The Bitcoin network has been running since 2009. Many things have happened with its price, users and applications of Bitcoin. Outside forces have tried to attack the system. It has been used to transfer hundreds of billions of USD around the world. And through it all, the system itself has consistently worked as intended.

## Using The Blockchain For Other Applications

A number of people saw use for these technologies in other areas- including in the area of law. But before we can look more into this usage, one more feature of Crypto-Currencies needs to be explained.

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48 Andreas M. Antonopoulos, *Mastering Bitcoin - Programming the Open Blockchain*: Chapter 1. Introduction. In a highlighted section called DIGITAL CURRENCIES BEFORE BITCOIN, the author explains that to succeed, any digital currency must provide an to answer three fundamental questions:

- *Can I trust that the money is authentic and not counterfeit?*
- *Can I trust that the digital money can only be spent once (known as the "double-spend" problem)?*
- *Can I be sure that no one else can claim this money belongs to them and not me?*

49 "SHA-2," Wikipedia, accessed May 3, 2018, <https://en.wikipedia.org/wiki/SHA-2>

50 "BitTorrent," Wikipedia, accessed July 1, 2018, <https://en.wikipedia.org/wiki/BitTorrent>

Bitcoin is not like a traditional currency that is sent from one account to another. In fact, Bitcoins always “sit” on the Blockchain. What changes hands is the ability to spend them based on their unique access keys. Moreover, the execution of a Bitcoin payment happens based on a script, as is explained by Andreas Antonopoulos:

*“Bitcoin transaction validation is not based on a static pattern, but instead is achieved through the execution of a scripting language. This language allows for a nearly infinite variety of conditions to be expressed. This is how bitcoin gets the power of **'programmable money.'**”*<sup>51</sup>

This means that besides simply spending money from A to B, there can be conditions applied to *how* and *when* it is spent. For example, the currency could be spent after certain predetermined conditions are met.

## Programmable “Money”

While Bitcoin is programmable, its script is simple and provides little flexibility. This shortcoming led Vitalik Buterin to develop Ethereum. Ethereum *“is a Blockchain with a built-in fully fledged Turing-complete programming language.”*<sup>52</sup> In theory, transactions on the Ethereum Blockchain can be subjected to any type of computation problem.<sup>53</sup>

Now, systems can be created that spend currency not based on human actions, but on computer code. This allows for systems to be built that can make transactions automatically without a central server, system supervisors or security systems. There are endless applications for this; self executing (smart) contracts, token systems used for crowd-funding, arbitration systems, financial contracts and even new systems of governance.<sup>54</sup>

A wide variety of projects have sprung up to focus on these new systems: their applications running on the Ethereum network or even entirely new Blockchains focusing on specific business cases.

It is out of the scope of this paper to focus on each individual projects as there are so many and so much work is being done. However, we can look at four distinct categories of Legal Applications that these projects focus on: Smart Contracts, Decentralized Jurisdictions, Decentralized Arbitration and Decentralized Companies.

In the next chapter we look at how these four Decentralized Legal Applications relate to the law.

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51 Andreas M. Antonopoulos, “Mastering Bitcoin - Programming the Open Blockchain”: Chapter 6, Transactions.

52 Vitalik Buterin, “A Next-Generation Smart Contract and Decentralized Application Platform,” (2013) accessed April 4, 2018, <https://github.com/ethereum/wiki/wiki/White-Paper>

53 Turing machine, Wikipedia, accessed on April 4, 2018, [https://esolangs.org/wiki/Turing\\_machine](https://esolangs.org/wiki/Turing_machine)  
“a Turing machine can make any sort of calculation that it is possible to precisely define an algorithm for.”

54 Vitalik Buterin, “A Next-Generation Smart Contract and Decentralized Application Platform”: Applications

## CHAPTER 3 – DECENTRALIZED LEGAL APPLICATIONS

### Category I – Smart Contracts

One of the major innovations in the Crypto-Space is the Smart Contract. In 1996 Nick Szabo wrote: “a Smart Contract is a set of promises, specified in digital form, including protocols within which the parties perform on these promises.”<sup>55</sup>

A primitive ancestor of a Smart Contract is a vending machine. It works by detecting the insertion of a quarter and then executes a sale. Smart Contracts take this principle to the next level. They can handle complex transfers of property as long as they are controlled by a digital means.

With the transfer of property, there are legal implications. How do Smart Contracts relate to the legal world? For that, we must take a step back and understand what a contract is.

#### What is a contract?

According to Burnham and Kraynak (2012) “A contract is simply a promise or set of promises enforceable by law.”<sup>56</sup> Based on this definition, two other questions arise; what law is being enforced and what makes promises enforceable?

The same authors write that in the United States “Contract law is nuanced and fact intensive. A ‘rule’ may differ, for example, depending on whether the parties are two giant corporations having their lawyers negotiate an agreement or family members making an agreement over the dinner table.”<sup>57</sup> We can conclude that the type of contract determines which laws apply. It is also safe to assume that in different countries, different laws apply.

Furthermore, they write that in order to be enforceable, a contract has to be “a bargained-for exchange that requires the following three ingredients:

- **Offer:** Party A’s promise to Party B in exchange for something.
- **Acceptance:** Party B’s assent to Party A’s offer.
- **Consideration:** What each party offers in exchange for the other party’s promise.”<sup>58</sup>

There are other requirements however for a contract to be valid. These include the contracting parties should be of legal age, the accordance of its agreed-upon matter with consumer protection statutes or whether legalities or fairness come into question.<sup>59</sup>

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55 Nick Szabo, “Smart Contracts: Building Blocks for Digital Markets,” 1996, [http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vw.h.net/smart\\_contracts\\_2.html](http://www.fon.hum.uva.nl/rob/Courses/InformationInSpeech/CDROM/Literature/LOTwinterschool2006/szabo.best.vw.h.net/smart_contracts_2.html)

56 Scott J. Burnham and Joe Kraynak, “Contract Law For Dummies,” (John Wiley & Sons, New Jersey, 2012): Part 1, Chapter 1.

57 Burnham and Kraynak, “Contract Law For Dummies”: Part 1, Chapter 1

58 Burnham and Kraynak, “Contract Law For Dummies”: Part 1, Chapter 1

59 Burnham and Kraynak, “Contract Law For Dummies,”: Part 1, Chapter 2

## Wet Code versus Dry Code

The question is: How do Smart Contracts relate to contract law? Contemplating this issue in 2008, Nick Szabo made the distinction between “wet code,” interpreted by the brain, and “dry code,” interpreted by computers.<sup>60</sup> The law uses wet code while Smart Contracts use dry code. To sum it up:

Wet Code = Traditional Contracts = Human Language  
Dry Code = Smart Contracts = Computer Language

## Can The Two Languages Merge?

Real world projects often end up very different from what was agreed upon to begin with, as explained in this example:

*An entrepreneur hires a programmer to build a website in six weeks. In the first week, the programmer finishes his milestone. In the second week, he falls sick and is unable to reach his milestone set for that week. In the third week, he manages to finish his backlog of work as well as his milestone for week 3. In the fourth week, he fails to meet his target due to a lack of feedback from the entrepreneur. In the fifth week, although the programmer intends to work, a nearby falling tree disrupts his Internet connection. The entrepreneur has had enough. He wants to terminate the arrangement and doesn't want to pay. The programmer however wants at least half of the agreed upon money for work already performed.*

Human language and Legal Systems are well adjusted to these subtleties. A judge or an arbitration court could come up with a fair and binding ruling. However, creating computer code beforehand prepared for all such variables is impossible. And this is a simple project.

In addition, contracts can be vague, contain mistakes or incorrectly reflect the intention of one or both of the contracting parties. It is naive to think that this is an aspect of Wet Code and that Dry Code doesn't have this problem. It is still, after all, written (and signed) by humans.

## Putting The “Smart” In Smart Contracts

To address these issues, ideas are proposed for future Smart Contracts to interact with the world. They could for example make use of a live-data feed of the weather to pay out crop insurance<sup>61</sup> or use prediction markets to discover an objective truth.<sup>62</sup>

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60 Nick Szabo, “Wet code and dry,” (Unenumerated, August 24, 2008), accessed April 15, 2018, <https://unenumerated.blogspot.de/2006/11/wet-code-and-dry.html>

61 Vitalik Buterin, “A Next-Generation Smart Contract and Decentralized Application Platform”: “Crop insurance. One can easily make a financial derivatives contract but using a data feed of the weather instead of any price index.”

62 Robin Hanson, “Shall We Vote on Values, But Bet on Beliefs?,” (George Mason University, 2013), <https://mason.gmu.edu/~rhanson/futarchy2013.pdf>:

“According to most experts in economics and finance, speculative markets are exemplary info institutions. That is, active speculative markets do very well at inducing people to acquire info, share it via trades, and collect that info into consensus prices that persuade wider audiences.”

But is fully relying on data wise? According to the Gerontology Research Group, only 35 individuals are known to have lived to the age of 112. Yet, the Social Security Administration of the United States has about 6.5 million people age 112 in their database.<sup>63</sup> Their deaths have simply never been registered! This could have significant consequences for live insurance Smart Contracts relying on these “official” numbers.

Moreover, numbers alone might not tell the entire story. Let's take the example of crop insurance mentioned earlier. Before a storm, an insured farmer might deliberately leave his crops in the fields, as he may prefer a payout after the storm hits. Or he manages to harvest half of his crops in time and what is left has significant value as pig-fodder. Subtleties like these cannot be coded in a Smart Contract.

In addition, Smart Contracts create a decentralized irrevocable commitment. But what if this agreement is ruled to be unlawful? For example, what if someone acting outside of his authority created it?

## Real World Use Cases

Work is underway on a wide variety of use cases, from banking to improving data in clinical trials.<sup>64</sup> Alternatives to Airbnb and very simple forms of flight insurance are already being explored (payout when delayed by two hours).<sup>65</sup>

On a critical note, the Crypto-Community seems to have some urgency to replace real world human interaction with predictable computer codes. But unlike computer codes, human action simply does not result in simple binary outcomes. It could therefore be argued that the main use of Smart Contracts is to automate specific (simple) aspects of a transaction, instead of trying to govern human behavior or complex projects. In this light, Smart Contracts would firstly be a technological development that facilitates the legal transfer of property.

Having said that, the predictability, transparency and measured outcomes of Smart Contracts offer a tremendous opportunity for real world applications. The final chapter provides a framework that allows the use of Smart Contracts in a lawful manner.

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63 Patrick P. O'Carroll, Jr., “Numberholders Age 112 or Older Who Did Not Have a Death Entry on the Numident,” (Office of the Inspector General, Social Security Administration, A-06-14-34030, March 2015), accessed on April 17, 2018, [https://oig.ssa.gov/sites/default/files/audit/full/pdf/A-06-14-34030\\_0.pdf](https://oig.ssa.gov/sites/default/files/audit/full/pdf/A-06-14-34030_0.pdf)

64 Timothy Nugent et. al., “Improving data transparency in clinical trials using blockchain Smart Contracts,” (F1000Research, 2016), accessed on April 17, 2018, <https://f1000research.com/articles/5-2541/v1>

65 Polyswarm, “5 Companies Already Brilliantly Using Smart Contracts,” (Medium, March 7, 2018) accessed on Jul 7, 2018, <https://medium.com/polyswarm/5-companies-already-brilliantly-using-smart-contracts-ac49f3d5c431>

## Category II – Decentralized Jurisdictions

An important question when exploring the legality of the Crypto-Space is the concept of jurisdiction – how does a system that only exists in cyberspace relate to the real world?

Let us first ask, what is a jurisdiction? This definition is from the Legal Information Institute:<sup>66</sup>

- *Power of a court to adjudicate cases and issue orders.*
- *Territory within which a court or government agency may properly exercise its power.*

“Jurisdiction” thus can have two meanings: the authority of a court to rule on a specific case, and the territory in which this authority is limited.

### Origins of Jurisdiction

Jurisdictions almost certainly began as a personal, rather than territorial links. During the feudal period, individuals would owe their allegiance to a king or other leader and he in turn would owe them the duty of protection.<sup>67</sup>

However, as we saw in the previous chapter, the State soon came to rule over territories. Nowadays, it is States that now have the right to enforce their laws and punish for non-compliance.<sup>68</sup>

To better understand what a jurisdiction is, we must understand what a State is. The 1933 Montevideo Convention provides a widely accepted definition.<sup>69</sup>

*“It is noted that a state as a person of International Law should possess the following qualifications:*

- a) a permanent population*
- b) a defined territory*
- c) a government*
- d) the capacity to enter into relations with the other states.”*

There have been other forms of jurisdiction too. In the history of English common law, a jurisdiction could be held as a form of hereditary property called a franchise. Municipal corporations, religious houses, guilds and early universities held various powers within them. However, even though such a jurisdiction was enforced neither by a State nor government, they were always tied to a physical territory.<sup>70</sup>

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66 Jurisdiction, Legal Information Institute, Cornell Law School, accessed on March 20, 2018, <https://www.law.cornell.edu/wex/jurisdiction>

67 Vaughan Lowe, “*International Law*”: Chapter 5.4, Jurisdiction over Nationals

68 Vaughan Lowe, “*International Law*”: Chapter 5.1, State Jurisdiction

69 Montevideo Convention on the Rights and Duties of States, (Montevideo, 26 December 1933), accessed on April 4, 2018, <https://www.ilsa.org/jessup/jessup15/Montevideo%20Convention.pdf>: Article 1

70 Nicholas J. Szabo, “*Jurisdiction as Property: Franchise Jurisdiction, from Henry III to James I,*” (The George Washington University of Law, April 21, 2006): Page 4

## Physical Territory Versus Cyberspace

We can conclude that the usual concept of jurisdiction in our Legal System is tied to physical locations. This is important to understand when we want to work on a Decentralized Legal System that has any meaning in the real world.

The discussion on the relationship between territory and cyberspace is not new. It has been going on since the development of the Internet. The current trend is that individual States claim jurisdiction based on the smallest of links, including servers' locations, the residence of a client and the use of a domain name.<sup>71</sup> Bertrand de la Chapelle and Paul Fehlinger (2016) compared the “hyper territorial” methods that national governments use to a legal arms race. The fact that there is no real consensus for regulation of the Internet, a technology that went mainstream in the 90s, does not bode well for those that call for the regulation of much more complex Decentralized Systems.

However, there is a third form of jurisdiction that does not involve a territory. A court can have jurisdiction by consent (or contract). This concept is explored in further chapters.

## Decentralized Applications Focusing on Jurisdictions

There have been projects that intent on creating Decentralized Jurisdictions. Examples include Aragon<sup>72</sup> and Bitnation Pangea.<sup>73</sup> The anarchistic nature mentioned earlier in this paper is clearly visible in both projects. The existing top-down legal order is rejected with the argument that it restricts freedom, and so these projects aim to create something completely new. But when you reject the current rules, you also reject their protection. This is important to remember when participants want their rights enforced in the real world or need limited liability in their business activities.

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71 Bertrand de la Chapelle, Paul Fehlinger, “*Jurisdiction On The Internet: From Legal Arms Race To Transnational Cooperation*,” (Internet & Jurisdiction, April 2016), accessed on April 5, 2018,

<https://www.internetjurisdiction.net/uploads/pdfs/Papers/IJ-Paper-Jurisdiction-on-the-Internet-PDF.pdf>

72 “*Aragon Whitepaper*,” Github (April 20, 2017), accessed on April 6, 2018,

<https://github.com/aragon/whitepaper/raw/master/Aragon%20Whitepaper.pdf>

73 “*Bitnation Pangea Whitepaper*” Bitnation - Governance 2.0, accessed on April 4, <https://tse.bitnation.co/>

## Category III – Decentralized Arbitration

One important question has to be answered: What if a dispute arises? After all, a Legal System only has value if justice can be enforced.

Suing a contracting party in a traditional court system can be problematic; it is often a lengthy process and language, lack of knowledge or neutrality may be an issue. What's worse is that a ruling in one country is often not directly enforceable in another due to differences in Legal Systems.<sup>74</sup> The concept of International Arbitration was thus developed to tackle this issue.

Arbitration is a private court system for resolving disputes. It has the following characteristics:<sup>75</sup>

- Parties who arbitrate have decided to resolve their disputes outside any judicial system.
- In most instances, arbitration delivers a final and binding decision, producing an award that is enforceable in a national court.
- The decision makers, usually one or three, are generally chosen by the parties.
- The parties are free to choose the governing laws as well as the seat and rules of arbitration.
- Parties can choose the place of arbitration and the language of arbitration.
- The power of the arbitrators to decide on a case depends on the explicit consent of the parties.
- Neutrality of the forum (staying out of other people's courts).
- The possibility to keeping proceedings and the resulting award confidential.
- The use of arbitrators with knowledge on the subject matter as compared to local judges.
- Less discovery, as compared to full scale litigation.
- The lack of opportunity for multiple appeals. Achieving a result in a short period of time.

### The Arbitration Agreement

An arbitration agreement creates a unique body of private law. Those involved consent to be subjected to this body of law by signing the agreement. The result is that arbitration courts can only rule on matters agreed upon in the contract. It is therefore recommended that arbitration agreements are written as broadly as possible. This way, they cover both disputes arising out of the contract's text, but also those based on tortuous acts or unfair business practices.<sup>76</sup>

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<sup>74</sup> Yuliya Zeynalov, "The Law on Recognition and Enforcement of Foreign Judgments: Is It Broken and How Do We Fix It?," (Berkeley Journal of International Law, Volume 31, Issue 1, 2013), accessed April 6, 2018, <https://scholarship.law.berkeley.edu/cgi/viewcontent.cgi?article=1435&context=bjil>: P. 152.

"this study concludes that the absence of an international enforceability regime for foreign judgments leaves a void in the realm of private International Law that sits in stark contrast to the well-established mechanism for enforcing foreign arbitral awards."

<sup>75</sup> Margaret J. Moses, "The Principles and Practice of International Commercial Arbitration," 3rd Edition, (Cambridge University Press, London, 2017): Combination of characteristics selected from Chapter 1

<sup>76</sup> Margaret J. Moses, "The Principles and Practice of International Commercial Arbitration," Chapter 2, B, 2, A

It is thanks to the New York Convention (1958) that arbitration awards are enforceable in almost any country in the world. During the convention, it was agreed that arbitration cases decided in the correct form in one of the contracting States are directly enforceable in other States without the need for a local court case.<sup>77</sup> At present, 156 countries are part of the New York Convention.<sup>78</sup>

Within the framework of International Arbitration, contracting parties are completely free to create their own private systems of law. But before we look at the opportunities this offers, we need to explore one more concept.

## Hierarchy of Laws

Not all laws are equal. There is a hierarchy of laws. A constitution is generally considered a “higher” form of law than a decree issued by the mayor of a city. That is why for example, the ultimate court in the United States, the Supreme Court, has the important task of ruling whether or not something is constitutional.<sup>79</sup>

A way to visualize this is the Russian Matryoshka doll,<sup>80</sup> where a smaller doll is restricted to the limited space allowed by a larger doll. In a way, the larger doll sets a “framework” in which the smaller doll has freedom to act. This can be explained by a simple example:

1. Two entrepreneurs want to start a Legal Entity. They sign a Memorandum and Articles of Association (M&A). Within this “contract” they have certain “freedoms,” such as deciding on the allocation of shares.
2. The M&A, is likely to be subjected to Company Regulations. These Company Regulations determine the legal requirements the company needs to meet. In a way, it creates a “*framework*” with certain boundaries that limit the freedom of the two entrepreneurs. For example, it explains the minimum amount of shares that needs to be issued.
3. Besides Company Regulations, the Legal Entity is subject to the general laws of the country of incorporation. You can think about tax laws or labor laws. This framework determines what a company can and cannot do.

It is important to understand that even though a lot of freedom exists for individuals to engage in contracts, these generally cannot be enforced if this would mean breaking a “higher” form of law. A labor contract cannot violate minimum wage laws. Alternatively, a house cannot be sold for a suitcase full of illegal narcotics. In such cases, the law is considered more important than contracts.

On the flip-side, a contract signed within the correct framework can enjoy the full protection of the legal system almost anywhere in the world. This is arguably even more relevant in a space that has very little regulation.

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77 “Convention on the Recognition and Enforcement of Foreign Arbitral Awards,” United Nations, (New York, 1958), accessed April 6, 2018, [https://treaties.un.org/doc/Treaties/1959/06/19590607%2009-35%20PM/Ch\\_XXII\\_01p.pdf](https://treaties.un.org/doc/Treaties/1959/06/19590607%2009-35%20PM/Ch_XXII_01p.pdf)

78 Margaret J. Moses, “*The Principles and Practice of International Commercial Arbitration*,” Chapter 1.C, Advantages of Arbitration.

79 “About the Supreme Court,” United States Courts, accessed July 26, 2018, <http://www.uscourts.gov/about-federal-courts/educational-resources/about-educational-outreach/activity-resources/about>

80 “Matryoshka doll,” Wikipedia, [https://en.wikipedia.org/wiki/Matryoshka\\_doll](https://en.wikipedia.org/wiki/Matryoshka_doll)

## The Legal Framework For International Arbitration

Now that we understand what a Legal Framework is, we can look at the framework for International Arbitration. This model comes from the book on International Arbitration by Margaret J. Moses (2017), who describes it as an “*inverted pyramid*.”<sup>81</sup> This can best be visualized as an umbrella for higher law that governs underlying laws:



## Governing Laws

What makes International Arbitration interesting is that it provides the contracting freedom to choose governing laws. This is usually a national law, such as English law. An obvious reason for this is that it is written in English. In addition, it has been used in international business for centuries. Moreover, it is transparent, predictable and flexible as it offers complete freedom of contract.<sup>82</sup>

However, there are also examples of “bottom up” laws that have been created by private parties, and not by governments. One example is Lex Mercatoria. The exact definition of Lex Mercatoria is debated, but it refers to a system of law developed during the Middle Ages that successfully governed international trading. Rather than a law belonging to one country, it could be considered as a general law of nations.<sup>83</sup> Currently, Lex Mercatoria doesn’t provide a codified framework that is accessible, clear or has established jurisprudence. Therefore, many practitioners refrain from using it as governing law.<sup>84</sup> However, such a framework *could* be developed. In fact, work on the unification of private law into comprehensible legislation is already underway, for example by UNIDROIT.<sup>85</sup>

## The Seat of Arbitration

The New York Convention requires contracting States to recognize and enforce arbitration awards made in *other* contracting States. This again refers to a physical location. For this to work, a “Seat of Arbitration” is required in one of the participating States. This goes against the concept of decentralization. But this issue is not new.

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81 Margaret J. Moses, “*The Principles and Practice of International Commercial Arbitration*”: Chapter 1.E, The Regulatory Framework

82 “*England and Wales: The jurisdiction of choice*,” The Law Society of England and Wales, accessed April 10, <http://www.eversheds-sutherland.com/documents/LawSocietyEnglandAndWalesJurisdictionOfChoice.pdf>

83 Robert Allen, “*Lex Mercatoria*,” World Encyclopedia of Law, accessed April 10, <http://lawin.org/lex-mercatoria/>

84 Margaret J. Moses, “*The Principles and Practice of International Commercial Arbitration*”: Chapter 4C, The Lex Mercatoria

85 “*History and Overview*,” (UNIDROIT), accessed May 12, 2018, <https://www.unidroit.org/about-unidroit/overview>

Online Arbitration already exist. An example is the service offered by the Hong Kong International Arbitration Centre, which offers a completely online arbitration procedure.<sup>86</sup> Hong Kong becomes the seat of such arbitration for a ruling to become enforceable.

## Delocalization versus Decentralization

Moreover, the concept of Decentralized Arbitration itself is not entirely new. In the 1980's, passionate arguments were made for the “*delocalization*” of arbitration. Delocalization is also referred to as “Stateless,” “floating” or “a-national” arbitration. It is based on a theory that local laws should not influence an International Arbitration.<sup>87</sup>

Providing valuable insight, Moses (2017) gives an important example of the result:

*“One response to the delocalization movement was a law passed in Belgium in 1985. It provided that parties to an arbitration in Belgium who were not Belgian citizens and did not have a business located in Belgium would not be permitted to apply to a Belgian court to set aside an arbitral award. There would thus be no judicial review of the award in Belgium. It was believed at the time this would increase the number of arbitrations in Belgium. In fact, however, the law had the opposite effect. Businesses were not drawn to a system with no possible court review. It appeared instead that businesses were avoiding it as a place of arbitration.”<sup>88</sup>*

It appears that for those involved in international business, an arbitration case with reduced oversight is considered less attractive. Two other studies had similar observations of arbitration in general. Eisenberg and Miller (2006) observed that from a sample of contracts filed by multinationals, only 20% contained arbitration clauses compared to 10% of domestic contracts.<sup>89</sup> And Ya-Wei Li (2006) concluded that only 15% of the international contracts studied opted for arbitration as a means of dispute resolution (of a small sample however).<sup>90</sup> This would indicate that the traditional court system is still very popular amongst those active in multinational operations. Apparently, when money is on the line, contracting parties opt for the (perceived) security that the State Justice Systems provide.

While International Arbitration has not removed the demand for traditional court systems, we can conclude that International Arbitration *is* a working system currently being used in real contracts. It can therefore be used as the enforcement framework for the Decentralized Legal System.

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86 Margaret J. Moses, “*The Principles and Practice of International Commercial Arbitration*”: Chapter B3B, Online Arbitrations

87 Margaret J. Moses, “*The Principles and Practice of International Commercial Arbitration*”: Chapter 4B, Delocalization V. Territoriality

88 Margaret J. Moses, “*The Principles and Practice of International Commercial Arbitration*”: Chapter 4B, 2, Arguments Opposing Delocalization

89 Theodore Eisenberg and Geoffrey P. Miller, “*The Flight from Arbitration: An Empirical Study of Ex Ante Arbitration Clauses in Publicly-Held Companies' Contracts*,” (New York University Law and Economics Working Papers, New York, 2006). Paper 70. [http://lsr.nellco.org/nyu\\_lewp/70](http://lsr.nellco.org/nyu_lewp/70): Page 2

90 Ya-Wei Li, “*Dispute Resolution Clauses in International Contracts: An Empirical Study*,” (Cornell International Law Journal: Vol. 39: Iss. 3, Article 15, 2006) Accessed April 7, 2018, <http://scholarship.law.cornell.edu/cilj/vol39/iss3/15>: Page 799

## Decentralized Applications Targeting Arbitration

There are a number of active projects in the Crypto-Space regarding arbitration. For this study, the whitepapers of Aragon, Bitnation Pangea, Kleros<sup>91</sup> and Jincor<sup>92</sup> alongside the proposal of DAMN<sup>93</sup> were analyzed.

Something in common to all of these projects is the lack of reference to seats of arbitration or Legal Frameworks. In fact, Bitnation Pangea is the only project that mentions a Legal Framework and the development of law, but not in the context of enforcement in the real world. DAMN is the only project that intended to research the possibility match the decentralized world with the legal world, but the project went nowhere.

There are a two recurring ideas on how decentralized rulings should be enforced: by reputation or by Smart Contract.

We saw in the analysis of International Law that a system based on reputation and consensus could work. But who says that individuals online care as much about their reputation on a specific network as a President of a nation State? This comes especially when there is a lot of money at stake.

Another recurring idea is the use of Smart Contracts funded by one or both parties that automatically awards payments based on the outcome of the arbitration. But when someone is of the opinion that he shouldn't have to pay a contracting party, why would he fund a Smart Contract with the risk of losing to it? Or why would someone try to win a sum he already owns?

Without an enforcement mechanism, Decentralized Arbitration is a paper tiger. Without a Legal Framework, its awards cannot be enforced in the real world. Moreover, without a guiding set of principles or governing laws, the outcomes of these systems will be even more random than the current legal systems they intend to replace.

Having said that, some innovative ideas are being proposed in the procedures, as well as the selection of arbitrators. Completely online (small) transactions or alternative forms of cooperation could perhaps benefit from such a form of arbitration. It could also provide the smaller fish in the pond access to a legal system, because a Decentralized Arbitration may very likely be cheaper than the traditional legal system.

Some ideas on the creation of enforceable Decentralized Arbitration and governing laws for the process are provided in the final chapters.

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91 Clement Lesaege and Federico Ast, "Kleros, Short Paper v1.0.5," (January 2018), <https://kleros.io/assets/whitepaper.pdf>

92 Vlad Kirichenko, Vagan Abelyan, Andrey Degtyaruk, "Jincor Whitepaper," (Version 1.9 - November 21, 2017), <https://jincor.com/whitepaper>

93 Pamela Morgan, Andreas M. Antonopoulos, "Decentralized Arbitration and Mediation Network (DAMN)," Third Key Solutions, LLC, accessed April 11, <https://github.com/thirdkey-solutions/damn/blob/master/proposal.asciidoc>

## Category IV – Decentralized Companies

Other innovations can be found in Decentralized Companies. A first example would be the Decentralized Corporation. A second example is the Decentralized Autonomous Organization (DAO).

### The Decentralized Corporation

In order to understand what a Decentralized Corporation is, we must first ask; what is a corporation?

A few characteristics make the “corporation” unique. First of all, it is the creation of a fictional legal person, separate from its owners, that potentially exists in perpetuity. A corporation has the right to own property, hire people, take on loans and engage in contracts. It can sue and be sued. A second important aspect of a corporation is that it limits the liability of the owners. It is thus a great way for investors to invest capital without risking bankruptcy and without the need to be part of day-to-day management. This division of roles and responsibilities is another important characteristic of corporations.<sup>94</sup>

### Origins of the Corporation

The corporation as we understand it today originated in 19<sup>th</sup> century England. Robert Lowe, a Liberal MP, spoke at the House of Commons in favor of limited liability. His words reveal the Classical Liberal desire to do business without restrictions:

*“My object at present is not to urge the adoption of limited liability. I am arguing in favour of human liberty – that people may be permitted to deal how and with whom they choose without the officious interference of the state... in my judgment, the principle we should adopt is this – not to throw the slightest obstacle in the way of limited companies being formed – because the effect of that would be to arrest ninety-nine good schemes in order that the bad hundredth might be prevented. (House of Commons, 1856, pp. 130–1)”*

### The Legal Framework Of A Corporation

One statement that can be heard in the Crypto-Community is that a corporation is nothing but a set of contracts.<sup>95</sup> Therefore, a set of contracts is all that is needed to create a corporation. However, what is really needed for a corporation to be *recognized* as one, is a Legal Framework. And to get an idea of what is needed in a Legal Framework, we can look at the English (UK) companies law.<sup>96</sup>

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94 Marie-Laure Djelic, “When Limited Liability was (Still) an Issue: Mobilization and Politics of Signification in 19th-Century England,” (Sage Journals, Vol 34, Issue 5-6, 2013),

<http://journals.sagepub.com/doi/abs/10.1177/0170840613479223?journalCode=ossa>: page 2

95 Vitalik Buterin, “Bootstrapping A Decentralized Autonomous Corporation: Part I,” (Bitcoin Magazine, 2013,) accessed April 11, 2018,

<https://bitcoinmagazine.com/articles/bootstrapping-a-decentralized-autonomous-corporation-part-i-1379644274/>

“When a corporation has limited liability, it means that specific people have been granted extra privileges to act with reduced fear of legal prosecution by the government – a group of people with more rights than ordinary people acting alone, but ultimately people nonetheless. In any case, it’s nothing more than people and contracts all the way down.”

96 “Companies Act 2006, Chapter 46,” [http://www.legislation.gov.uk/ukpga/2006/46/pdfs/ukpga\\_20060046\\_en.pdf](http://www.legislation.gov.uk/ukpga/2006/46/pdfs/ukpga_20060046_en.pdf)

The following are examples of important requirements for the establishment of a corporation:

- Registration in the register of companies
- A signed memorandum
- A certificate of incorporation
- A Registered office
- Names of proposed officers

A registered office and a company registrar are physical locations. Although laws vary, the requirement of registration at a physical location appears to be universal.<sup>97</sup> In addition, for a UK court to recognize a foreign corporation, registration in a recognized State is crucial.<sup>98</sup>

Under current law, corporations are tied to physical locations. The odds of getting a Decentralized Corporation as a legal person seem small. This means that Decentralized Corporations cannot own property, engage in contracts, sue or be sued or shield investors from liability. At least for the time being. The final chapter provides some suggestions on how to create Decentralized Corporations that can be recognized.

## The Decentralized Autonomous Organization

The Decentralized Autonomous Organization (DAO) is very different. In fact, there is a lot of discussion on what a DAO is. Allan & Overy (2016) provide a good summary:

*“A Decentralized Autonomous Organization (DAO) is a computer program, running on a peer-to-peer network, incorporating governance and decision-making rules. DAOs can be programmed to operate autonomously, without human involvement, or the code can provide for direct, real-time control of the DAO and funds controlled by it. The earliest DAOs are software controlled community organization experiments which seek to re-implement certain aspects of traditional corporate governance, replacing voluntary compliance with a corporation’s charter with actual compliance with pre-agreed computer code.”*<sup>99</sup>

When we look at this from a legal perspective, it is clear that a DAO is neither a corporation, nor any other type of existing Legal Personality. It doesn’t have a registered office and has no physical place of business or registration. There are no shareholders or managers. Therefore, it cannot perform many of the tasks commonly attributed to it, like owning property or engaging in contracts.

Without the veil of corporate protection, participants in a DAO should take precautions if they want to be shielded from liability or taxes. A simple solution is provided in the chapter five.

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<sup>97</sup>“All company registers,” (OpenCorporate, The Open Database Of The Corporate World), accessed April 11, [https://opencorporates.com/registers?all\\_registers=true](https://opencorporates.com/registers?all_registers=true)

<sup>98</sup> “UK Foreign Corporations Act, 1991,” <http://www.legislation.gov.uk/ukpga/1991/44/section/1>

<sup>99</sup> Allen & Overy, “Decentralized Autonomous Organizations,” (Allen & Overy LLP 2016), <http://www.allenoverly.com/SiteCollectionDocuments/Article%20Decentralized%20Autonomous%20Organizations.pdf>

## CHAPTER 4 – DIFFERENCES AND OPPORTUNITIES

Before we look at solutions to the issues so far raised in this paper, let us review the most important differences and similarities between the Crypto-Space and the Law.

Legal systems are based on ideas and best practices dating thousands of years. They are subject to ever-changing opinions and ideologies. Their outcomes and definitions are uncertain. Legal systems evolve slowly in a non-linear fashion over time and their development and workings are not transparent.

Decentralized technologies are based on hard science, mathematics and cryptography. They are formed by peer-to-peer networks and run by consensus. They provide a cryptographically secure framework that can be trusted to provide a predictable binary outcome. The systems and their development are transparent, open source and can be inspected by anyone.

We must acknowledge that the development of a Legal System is not the same as the development of a technology. Proven technologies form a base layer on which future technologies can be build. An example is the Internet, for which original protocols like TCP/IP and DNS still function as the base-layer for new layers of technologies.<sup>100</sup> As a result, the way the Internet works doesn't change with the election of a new judge or government. One could argue that conventions, constitutions and declarations of independence function as a base-layer for our Legal System, but their interpretations and effects change over time. In a Legal System, top layers change the underlying layers over time. It is more organic and "alive."

We learned that Smart Contracts on their own cannot be considered a contract under the law. We also learned that it is unlikely that dry code could govern human interaction. Yet, Smart Contracts may nevertheless improve real world contracts, by providing a technological, predictable and secure foundation. As such, several large-scale applications of this technology are emerging.

We learned that the lack of connection with the real world ensures that current Decentralized Jurisdictions (in a territorial sense) are incompatible with our current legal system. However, this doesn't rule out the possibility for an environment to be created that governs decentralized issues. It also doesn't rule out the ability for people to organize themselves based on consensus to create a unique Legal Framework.

We learned that current Decentralized Arbitrations lack a Legal Framework for governing disputes. Without a proper Legal Framework, their rulings are not enforceable in the real world. We also learned that the current legal system allows the freedom for creating Private Law based on contracts, and even forms of governing law.

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100 "History of the Internet," (Wikipedia), accessed Aug 18, 2018, [https://en.wikipedia.org/wiki/History\\_of\\_the\\_Internet](https://en.wikipedia.org/wiki/History_of_the_Internet)

Finally, we learned that Decentralized Corporations lack the framework to be considered Legal Persons under the law. Decentralized Autonomous Organizations provide innovative ways of cooperation, but are mostly technological rather than legal developments. Moreover, we discovered that without legal personality, these Decentralized Companies cannot own property or engage in contracts and do not protect their users from liability.

## **Standing On The Shoulders Of The Law**

Some of the developments presented in the Crypto-Space as new inventions are not new at all.

The concept of Decentralized Arbitration has been addressed in the discussions surrounding delocalized arbitration. Arbitration Courts that are completely online also already exist. The same goes for the creation of Decentralized International Law and non-governmental private law created in a “bottom-up” fashion. Using live-data and computer models to manage real world property is already happening, as seen with the algorithms used by Wall Street, for example.

The key takeaway from all of this is that there is a need for a Legal Framework for these Decentralized Legal Applications. In addition, we need this Legal Framework to have force in the real world. It makes much more sense to build this system on the Law’s foundations of liberty and individual rights than try to reinvent the wheel.

The coming chapter provides such a framework.

## CHAPTER 5 – DECENTRALIZED LEGAL FRAMEWORKS

We learned there is room to create “private” legal systems on the basis of decentralized principles. A system of law that is not created by an individual or group of persons organized in a government. A system not enforced, but accepted. A system that exists in cyberspace, but has force in the real world. A system of laws written for the Crypto-Community, that is both respected and accepted.

But first, we need to address the issues raised in the previous chapters, starting by providing a Legal Framework for the four categories mentioned. It shall be clear that the Decentralized Legal System is just a logical next step.

### Consensus Jurisdictions

As discussed, jurisdiction is the legal right of a court to order coercive processes. There are only three ways of creating jurisdiction: <sup>101</sup>

1. Sovereignty
2. Property
3. Contract

The first two ways are based on physical locations. However, the third is not. We already saw in the chapter on arbitration that contracts can create a private body of law that binds the contracting parties. The question now is, why should there be a limit to the amount of people that sign a contract?

Technology exists for a collective to sign a Consensus Contract as if accepting the terms and conditions page of any website. This way, a *jurisdiction by consensus* can be created, where the participants have agreed to cooperate under a certain set of rules. Participants of such a Consensus Jurisdiction could then engage with each another while subject to the wider contract.

Such a system could even be enforced in the real world. After all, a framework for enforcing private contracts already exists: the New York Convention. Subjecting a Consensus Jurisdiction to this framework is surprisingly simple. It is in fact just a matter of adding a clause to the Consensus Contract to explain that any disputes arising under it are subject to arbitration and said framework. Provided the correct Seat of Arbitration and Governing Laws are chosen, the case could be heard online. The arbitrators could rule on any dispute arising from the contract and this ruling would be enforceable in most countries around the world.

In order to start creating Decentralized Legal Frameworks, we can simply build upon the framework of International Arbitration as presented in chapter three.

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101 Nick Szabo, “*Three kinds of jurisdiction*,” (Unenumerated, October 20, 2006), accessed April 20, 2018, <https://unenumerated.blogspot.de/2006/10/three-kinds-of-jurisdiction.html>

**For the Consensus Jurisdiction, the Legal Framework would look like this:**



It is important to remember that the *Jurisdiction* that arbitrators would have is restricted to whatever has been agreed upon. In addition, there are significant areas of public law that private contracts cannot “breach,” including family, criminal or tax law. Therefore, initial use cases are likely to be industry-specific collaborations with a set of guiding principles for relatively standardized recurring transactions. Examples could be found in areas such as international trading, e-commerce and international freelance work.

## **Decentralized Arbitration Enforcement Framework**

In order to provide a framework for Decentralized Arbitration, two different types of potential disputes need to be distinguished: those that require enforceability in the real world. and those that don't.

The majority of real world transactions are small. Think about everyday purchases, small assignments, electronic products or license fees for the use of a video. For many of these transactions, there may be no need for the backing of a full-fledged legal system. In fact, access to the conventional legal system might be too expensive and cumbersome for a dispute with a small monetary value. Such transactions could be subjected to Decentralized Arbitration instead. In terms of a Legal Framework, it looks like this:



However, some may not feel comfortable with a completely decentralized option. Think about a company exporting large amounts of natural gas or selling a subsidiary company. It would need a way to enforce its rights in case something would go wrong.

As discussed earlier, a framework for enforcement already exists. It would be a very simple process to include such an arbitration process in a Legal Framework for Decentralized Arbitration. For example, the parties could consent to Decentralized

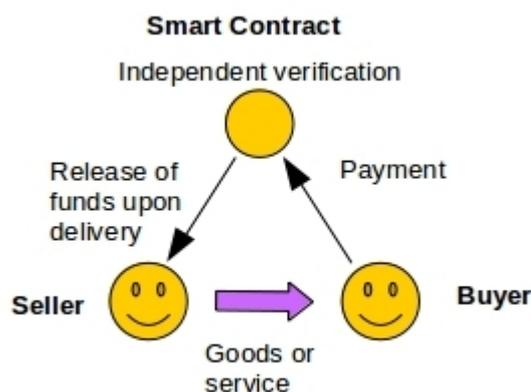
Arbitration, and if one of the parties would not keep to the ruling, an online arbitration with physical seat could provide an enforceable ruling instead. It would look like this:



## Smart Contract Blocks

In order for Smart Contracts to have any force in the real world, they need to be wrapped in a wet code framework. This can be made clear with a simple example:

*A seller sells goods to a buyer. Think about the “Amazon Model,” the shipping of the product to the buyer by courier. The buyer pays into a Smart Contract. The Smart Contract independently verifies the sale of the product and releases the funds if all conditions of the sale are met. When either the independent verification takes place, or the buyer approves the transaction, the payment is released. If the payment isn’t released within one month, the payment is returned:*



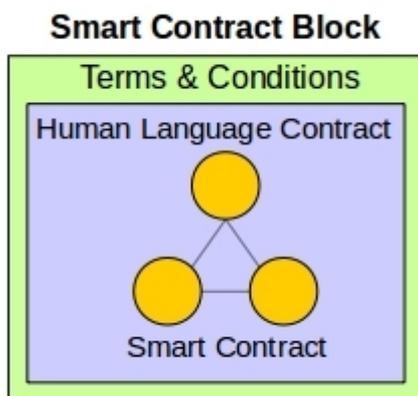
*The independent verification could either be carried out manually by a third-party, or fully automatically. In this case, a Smart Contract tracks the delivery online with data feed from the courier. Upon delivery, the funds are released.*

Even though the vast majority of transactions go smoothly, even such a simple transaction could lead to a dispute. The package could be delivered to the wrong person or arrive damaged by rain. It is at this point that the Human Language Contract becomes important.

There are existing ideas on merging Smart Contracts with legal documents. They mostly look at it however from a technical angle or focus on a specific type of contract.<sup>102</sup> They often overlook a simple way to create a bond between a legal contract and a Smart Contract; at the start of a Human Language Contract, in the clause identifying the parties, a hash or link could be included corresponding with the appropriate Smart Contract.

To simplify the Human Language Contract, an additional step could also be included. To deal with transactions such as mentioned in the example, Terms and Conditions are required. Major shipping companies such as Ebay and Amazon have developed tried and tested examples. We can use such existing Terms and Conditions as a framework for the Human Language Contract, which in turn is linked to a Smart Contract. This could be called a Smart Contract Block.

This way we create very simple contracts with a limited amount of variables. The bulk of the clauses governing the Smart Contract Block can be found in the Terms and Conditions.



Another main benefit of this approach is standardization. Smart Contract Blocks could become reliable after being used and tested over time. With them, users can simply pick the Block most suitable for their transaction and fill in the details relevant for their transactions. It could be like selecting an App in the Appstore. Widely used Blocks that contain a proven enforcement framework could become valuable assets for their creators. At the same time, they are likely much cheaper to use than uniquely drafted contracts.

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102 Ian Grigg, "The Ricardian Contract," (Systemics, Inc., 2004), accessed August 12, 2018, [http://iang.org/papers/ricardian\\_contract.html](http://iang.org/papers/ricardian_contract.html)

## Decentralized Corporation Nexus

Without some sort of physical location of registration, decentralized legal entities are unlikely to be recognized by the current legal system. Although this may change one day, for now we need to deal with this reality.

As we saw, amongst the essentials for a Corporation to be recognized is its registration at a company registrar. It has to be noted that in jurisdictions such as Delaware and the UK, the procedure of registering a corporation in their respective company registrars is almost completely digitalized. Thus in mind, a more decentralized solution is only a small and realistic step forward.

One could argue that Blockchains are perfect for establishing a company register. Companies could be registered on the Blockchain under a clear and understandable set of company regulations, similar to those companies are governed by in the British Virgin Islands.

A unique company number, a certificate of incorporation and company documents could be issued automatically and remain verifiable on the Blockchain. This last feature also could prevent translation and expensive legalization issues that corporate documents currently have when used across borders.

The requirement of having a physical location could also be met. International tax laws dictate that one obtains a “*Permanent Establishment*” based on the activities or management of a company. And this works both ways. If countries obtain taxing rights, it is only logical to conclude that companies then also obtain registration rights. In this light, a Decentralized Corporation could be considered registered at the place of effective management.

A second option could be for countries to provide “landing zones” for Decentralized Corporations; a so-called Nexus. A similar process of incorporation would apply, but now a country of registration and registered office is clearly assigned. Countries could establish free zones, like those successful in Dubai, specifically for registering such companies.

The two options schematic:

<b>Permanently Established Decentralized Corporation</b>	<b>Nexus Decentralized Corporation</b>
<p data-bbox="172 1668 715 1809">Decentralized incorporation and registered in a country of residence or business based on management and activities.</p> <p data-bbox="172 1848 754 1955">This is a Decentralized Company but incorporated under a standardized set of international regulations.</p>	<p data-bbox="818 1630 1409 1771">Decentralized incorporation with a fixed nexus country for incorporation and registered office in a fixed country of residence.</p> <p data-bbox="818 1816 1425 1921">This is a local company but incorporated under a standardized set of international regulations.</p>

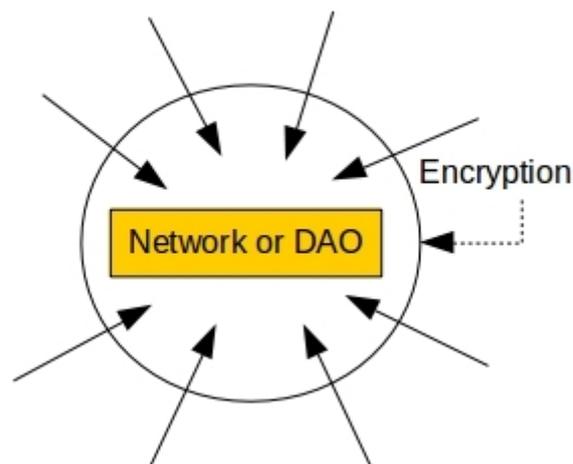
Over time, a global standard and one set of universal company regulations could establish a type of Corporation that is the same everywhere. It would make the process of setting up a Legal Entity uniform, simple, transparent, quick and cheap- just as the people who established limited liability intended it to be.

A note has to be made on privacy: some company registries display a lot of information publicly. Due to the public nature of the Blockchain and increasing concerns for privacy, as little information as possible should be included in Blockchains. As a solution, a hash, or encrypted version of the relevant incorporation data could be visible on the Blockchain with its key only provided to relevant parties. Having said that, registration countries will likely enforce their local KYC requirements.

## Limited Liability And A DAO

As mentioned earlier, a DAO is not a Legal Entity. However, some important notes have to be made on this new form of collaboration.

Cryptography has created an impenetrable layer “around” Crypto-Currency networks. The result is that what happens within these networks is protected from outside influences by a cryptographic “*Circle of Protection*.” This is demonstrated by the following figure:



This means that use of these networks, including DAO's, cannot be restricted. Regulation can therefore only focus on the participants (black arrows) of the network. For example, users can be held liable for whatever happens within a DAO or fully taxable on its proceeds.

In certain cases, users could use a “*layer of protection*” when accessing the network when limited liability or taxation are a concern. Such a layer could be established by the previously mentioned Decentralized Corporation, or the corporate veil of an existing legal structure.

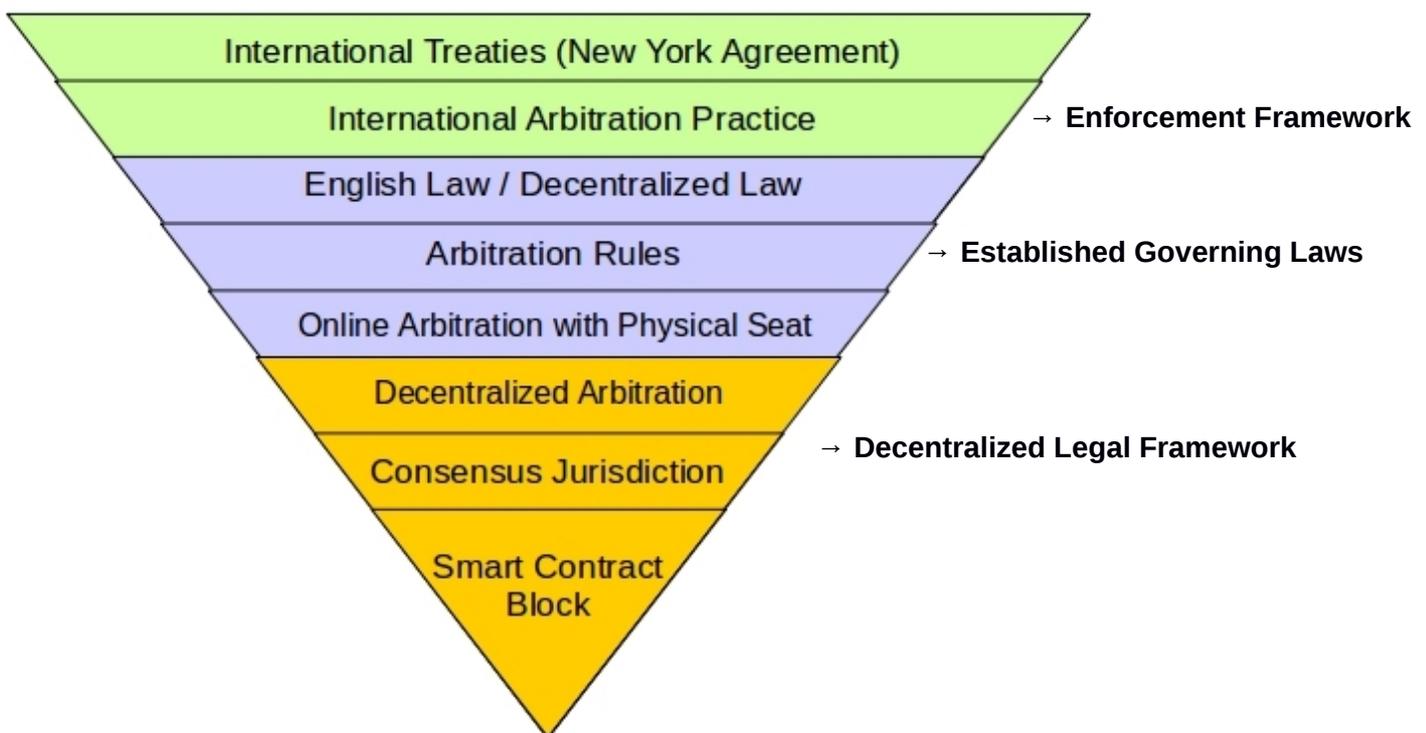
## CHAPTER 6 – THE DECENTRALIZED LEGAL SYSTEM (DLS)

*“Learn the rules like a pro, so you can break them like an artist.”*  
Pablo Picasso

Now it is time to merge everything together for the framework of the Decentralized Legal System. An international transfer of goods is used to explain this framework.

*A seller and buyer meet online. Both are participants in a Consensus Jurisdiction. The Consensus Jurisdiction provides regulations on shipping, payment terms, and making and accepting offers.*

*They agree on a deal, and select a tried and tested Smart Contract Block that governs the transaction. They agree to Decentralized Arbitration, but since the transaction is quite large, they agree upon a general arbitration clause that can be activated if Decentralized Arbitration does not lead to a desired outcome. They select English law as the governing law. Here is a figure to show how this would look:*



A system like this would merge a Smart Contract Block with a tried and tested Enforcement Framework. From a legal point of view, such a transaction could be governed in a completely decentralized manner (orange). If needed, this could be backed by existing arbitration frameworks and governing laws (blue) and enforced by the enforcement framework (green)

Only one question now remains: Can the DLS be governed by Decentralized Law? This is discussed in the remaining part of the paper.

## Creating Decentralized Law

Earlier, when looking at Legal Frameworks, we saw the common practice of using English Law as governing law. However, these governing laws could be replaced (partially) by Decentralized Law.

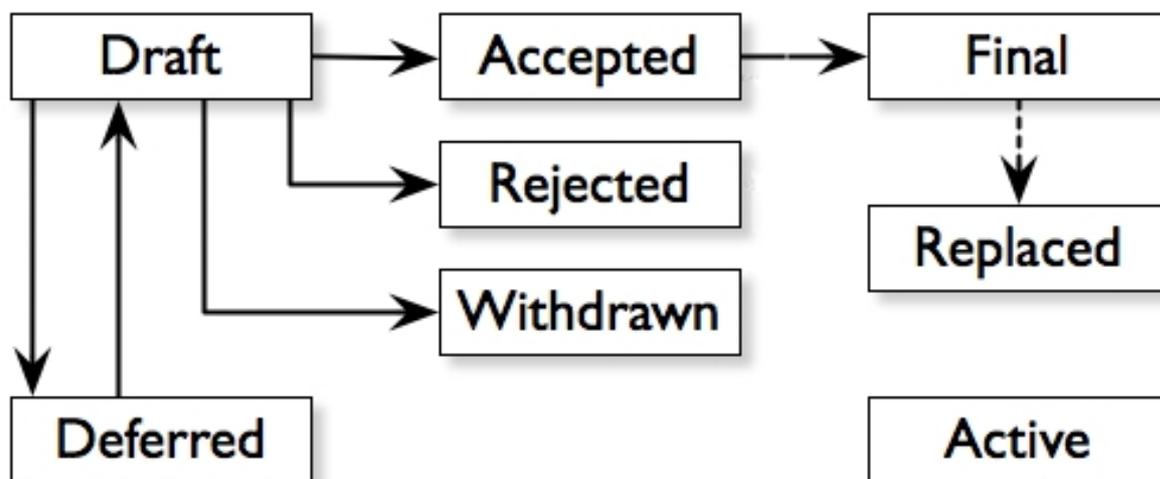
In order to create Decentralized Law, we must overcome two hurdles. The first is a model for the creation of laws and regulations. The second is a model to publish and accept these laws. A way to create laws could be taken from the best practices in decentralized open source software development proven effective by Bitcoin: the BIP.

### Using “BIPs” To Create Decentralized Law

Bitcoin is a fully Decentralized System. As a result, no one developer is responsible or its mechanisms. Adjustments to the protocol start when someone makes a proposal for an amendment to its code, known as a Bitcoin Improvement Proposal (BIP).<sup>103</sup>

The first step is for members of the network to debate the need for this BIP. For this, everybody can participate in an open discussion. Meanwhile, the BIP is tested and scrutinized to ensure its security. During this process, the Crypto-Community at large gets involved. The initiators try to gain support for their project, which often involves politics. At a certain point, the Improvement is launched. At this point, it is then up the network to either accept or reject it in what is both a voluntary and democratic process. If enough users accepts and use the BIP, it is implemented.

#### BIP Workflow:<sup>104</sup>



This process makes Bitcoin respected and trusted by the community. All the while, Bitcoin keeps improving. So far this process has worked well and thus can now act as a foundation for other complex aspects of society.

103 “Bitcoin / Bips,” (Github), <https://github.com/bitcoin/bips>

104 “Bitcoin Improvement Proposals,” (Bitcoinwiki), accessed May 14, 2018, [https://en.bitcoin.it/wiki/Bitcoin\\_Improvement\\_Proposal](https://en.bitcoin.it/wiki/Bitcoin_Improvement_Proposal): small simplification made.

## Github

Github is an interesting tool that is used for open source processes, including BIPs. It is a website that allows software developers from around the world to cooperate on open source software development projects.<sup>105</sup> It is based on software known as “Git.” Git is a version control system for tracking changes in computer files and coordinating work on those files by multiple people. It is primarily used for source code management in software development, but can be used to keep track of changes in any set of files.<sup>106</sup>

Git allows for multiple people to cooperate on a single project while keeping track of all changes. It allows for side-projects that can later be merged into the main project. It also allows everyone to see what has happened and how a certain result has been achieved. In addition, there are forums that allow discussions on different aspects of the project.

Given its success in the software community, this process could also be adapted to create law. Legal experts could come together and work on legislation as if they were working on an open source software project. Public discussion of the goals and usability of the law could be made possible. A particular clause of the law could be sidetracked and discussed. Then, once some form of consensus has been reached, the clause could then be added to the main legislation. Such forms of consensus make future acceptance more likely. Of course, a more user-friendly interface could be created as well for the development of law for less technologically minded people.

## Best Practices

On a final note, we must remember that law doesn't fall from the sky. Great and clear legislation exists in different parts of the world. Thus, existing law could be the input for this process. Next to that, most States already have processes for law creation. Perhaps they can include an open source process to end up with more widely accepted forms of legislation. The technologies are now available.

## Using A “Legal Wiki” To Codify Law

The public Wiki is another existing technology that lends itself perfectly to the codification and publication of Decentralized Law. An important example of a Wiki is Wikipedia. Wikipedia uses open source software called MediaWiki that can be used by anyone to create a public Wiki.<sup>107</sup>

Wikis are extremely applicable here as they are both lightweight and easy to use, and familiar to the general public. They are perfect for hosting large bodies of text. In addition, it is easy to hyper-link to relevant clauses within the law, to important rulings or to higher laws. This makes them more accessible and usable compared to the current system consisting of random selections of constitutions, books, rulings and separate laws created over time.

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105 “Github,” <https://github.com/>

106 “Git,” (Wikipedia), accessed April 19, 2018, <https://en.wikipedia.org/wiki/Git>

107 “MediaWiki,” (Wikipedia), accessed April 19, 2018, <https://en.wikipedia.org/wiki/MediaWiki>

## Publishing and Accepting Decentralized Law

Next, the proposed legislation must become law. This can simply be achieved by publication and subsequent acceptance. Ideally, its publication is subject to acceptance. This way, only widely supported legislation may become a part of law as we saw in the BIP process. Some ideas on how to publish and accept Decentralized Law are:

**1) Static Publication.** It is fashionable to want to create a Blockchain for everything. But Law consists of static documents. They are not like Crypto-Currencies, where a lot of transactions need to be secured. In addition, an open source development process in combination with voluntary acceptance guarantees a high level of decentralization.

Therefore, it could be argued that a static publication of any of the versions of Decentralized Private Law should suffice for the task at hand. A respected expert, website or NGO could publish and maintain such Law. Publication within Consensus Jurisdictions or by existing organizations like UNIDROIT could also be possible. As mentioned earlier, industry specific organizations are also likely candidates to create regulatory standards. If needed, these Laws – and subsequent versions – could be “time-stamped” on an existing Blockchain such as Ethereum for verification purposes.

**2) Voting.** Laws could be subject to a voting process. Many different collectives could partake, including a group of industry participants, a social group, a decentralized Consensus Jurisdiction and the inhabitants of certain geographical areas.

**3) On Chain.** A specific Legal Blockchain could be created. The “*transactions*” on this Blockchain could be hashes of Law publications on a public wiki. Currently, everybody can make amendments to a public wiki. However, a Legal Wiki could be subject to both publication and amendment procedures protected by the Blockchain. For example, a publication could be approved if a certain percentage of the participants agree, or an amendment made if four out of five legislators approve. Multiple projects could compete for the data in the Blocks, providing an incentive for network security. Alternatively, an application could be created on top of an existing chain.

**4) Prediction Markets** are another widely theorized way for the future of Decentralized Governance. People can bet on the acceptance or disapproval of a Law by depositing a small fee in a Smart Contract. After all, the publication of a Law could be reduced to a yes/no decision. The winners of the vote divide the funds of the losers. Although betting on Laws seems radical, the idea is that those with a direct stake in the process have an incentive to make the best decisions, and thus are more likely to be on the “right” side of an uncertain outcome.<sup>108</sup>

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108 This appears to be the most important idea in the Crypto-Space on future governance. Popularized by Ralph C. Merkle, “*DAOs, Democracy and Governance*,” (Cryonics Magazine, July- August, Vol 37:4, pp 28-40, 2016), Version 1.9, <http://merkle.com/papers/DAOdemocracyDraft.pdf>. He came up with a framework for using a DAO to implement a prediction model that in turn was theorized by Robin Hanson, “*Shall We Vote on Values, But Bet on Beliefs?*” Both authors provide a more balanced view of the possibilities of prediction models compared to the projects quoting them.

## **Amending Decentralized Law**

Laws change. Although they are written with the best intentions, they may become outdated as time passes. Some clauses may need to be rephrased while others may be proven redundant. Decentralized Law could address this via the introduction of an amendment process guided by mathematical restrictions.

Let's take a piece of law consisting of 1.000 words and 6.000 characters on a rule-based Legal Wiki as an example. The rules could allow for periodical amendments to be made. A restriction could be placed on the amount characters or words that can be changed, such as the total amount of words is only allowed to increase by 10%. In this example, the amended law could have a maximum of 1.100 words. In addition, the acceptance of amendments could be subjected to the publication process mentioned above.

To apply this process to a legal system, a legislator could propose an amendment to a Law by redrafting some clauses and adding a few new ones. As the amount of characters is limited, he would ensure that what is proposed falls within the boundaries set out by the system. He would do so by writing clearly and removing unnecessary and difficult words.

This way, Decentralized Law could slowly change over time and be kept relevant, just like the Bitcoin Protocol. In addition, it would ensure that clauses are selected carefully, kept to their essential meaning and are written in simple words. Such a process leads to orderly, accessible and simple legislation that can be understood by anyone. It also prevents out of control legislation by limiting what can be added.

The downside to changing laws could be the legal uncertainty or confusion it causes. This could be tackled by allowing periodic amendments only once every five or ten years. Alternatively, no amendments could be allowed to core areas, or only addendums of a limited size could be allowed. In any case, Decentralized Law makes it easy to figure out which laws were applicable to certain actions or contractual obligations as well as how these have changed – more so than today at least.

## **Incentives for Making and Maintaining Decentralized Law**

In the Crypto-Space, incentive-based systems have proven to lead to the best outcomes in terms of security and usability. A widely accepted piece of legislation could act as a piece of online real estate, benefiting and promoting the creators.

Consensus Jurisdictions could compete for users by creating state-of-the-art Laws and Procedures. Users could pay a small fee for the use of these systems. In exchange, they could enjoy the protection of a tried and tested legal system that is both well maintained and well enforced. Competition would lead to the establishment of the best systems. It would also lead to specialization, as has happened on the Cayman Islands which now have state-of-the-art fund formation regulation.

## CHAPTER 7 - A WORLD GOVERNED BY DECENTRALIZED LAW

As is clear, the ideas so far presented are based upon Private Law. The private arbitration framework based on private contracts is a good example of this as well as the creation of frameworks for specific industries and private Consensus Jurisdictions. Some may ask however, how does this relate to the world of law making at large?

The creation of Public Law is the domain of governments. In most countries, this is subject to a democratic process. This process is generally founded on the principle of separation of powers, as generally attributed to Baron De Montesquieu.<sup>109</sup> The principle suggests that tyranny could only be prevented should no branch of government hold all powers. Thus, powers are generally divided into law-making, executive and judiciary branches. It shouldn't be forgotten that these ideas were developed during a time when monarchs still had *all* the power. The separation of powers was a step forward. The question we can now ask is: Why should all pillars of power involve the government?

An alternative system could be an executive branch that manages the government, a judiciary branch that enforces justice and a Decentralized Process that creates the law. This Decentralized Process could even be managed by legislators, but involve the public at large. For some, this sounds radical. But remember that this is already happening!

We already saw how globally enforced legislation exists outside of the democratic process. We also saw that Private Law creation dates back centuries with Lex Mercatoria. Adding to this are private arbitration centers that rule on private contracts and make use of the public judiciary branch to enforce rulings.

### FIFA Law-Making

In the summer of 2018, the football World Cup took place in Russia. It is the Fédération Internationale de Football Association (FIFA) that creates – and updates – the rules of this global spectacle. One of its new innovations that year was the VAR. This new system allowed the referee to review a situation on video so he could make better decisions. This system is now also being used in national competitions.

FIFA is a private organization. And football is no small thing. The World Cup is one of the largest events in the world. And yet, it is not public laws that regulate football. Now let's assume that football was so dangerous that people would die on the pitch every week. It wouldn't be long before the government would step in and "do something." The conclusion is that FIFA can regulate the global interaction of large groups of people without the involvement of government, as long as public interest isn't harmed in its oversight.

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<sup>109</sup> Charles De Secondat, Baron De Montesquieu & Translated By Thomas Nugent, "Spirit of the Laws," (1752): Page 173, "In every government there are three sorts of power: the legislative; the executive in respect to things dependent on the law of nations; and the executive in regard to matters that depend on the civil law."

However, there are other indirect ways that demonstrate how such an organization can influence law. A government consists of people and these people do not live in a vacuum. The first place that a government employee would look to if asked to regulate football would be the existing rules and regulations of organizations like FIFA. After all, why reinvent the wheel?

## Legal Reflexivity

Not only do public policies affect private affairs; private affairs also affect public policy. This concept could be compared to a theory in finance known as Reflexivity.<sup>110</sup>

The theory argues that the financial state of a public company determines its stock price. Simultaneously however, the company's stock price also determines the financial state of the company. For example, if the stocks of a company have collapsed, a bank might want a higher interest rate or a supplier may have stricter payment conditions.

This process can be observed in the real world too. An example is the refugee crisis in Europe, where judges determine the cases of asylum seekers based on reports from NGOs; reports written in support of the plight of the asylum seekers.<sup>111</sup> Another example is the controversy stirred up by the OECD on the tax-avoidance practices of multinationals; a practice for which the OECD tries to enforce regulations. Such processes can be found everywhere.

It is merely the misunderstanding of this process by the public at large that allows these organizations to yield such influence. However, this process could be brought into the open with the more public process of creation and acceptance of Decentralized Law.

## The Benefits Of Decentralized Law

Let's not forget the open source process by which Decentralized Law could be created. Legislation created in this matter will be fair and readily followed as participants create it in a bottom-up fashion.

In addition, there are lots of areas where Decentralized Private Law could step in and regulate the interaction of large groups of people. In fact, there is no use in waiting for government legislators to act. They simply don't understand Decentralized Systems and just impose Anti Money Laundering legislation and pretend to do something. The time is now for others to start working on functional frameworks of Decentralized Law.

Once a new standard emerges, it is a safe and popular bet for governments to incorporate this in their legislation. As far as enforcement goes, judges are supposed to be independent and base their judgment on the law. For them, there should be no difference in how the law is created. They might even feel more comfortable in ruling based upon widely supported and accepted Decentralized Law than top-down enforced public law.

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110 George Soros, *"The Alchemy of Finance,"* (John Wiley & Sons, Inc., Hoboken, New Jersey, 1987)

111 As witnessed by the author in the immigration court in the Netherlands.

## The Future Of Law?

We have endured a long and hard battle for power with our rulers for the establishment of individual freedoms under laws that equally apply to everybody. However, as the creation of law still sits in the hands of government and is applied in a top-down manner, we are still very much subjected to Centralized Law.

Using the Decentralized Legal System, we can immediately start creating bodies of Private Decentralized Law based on consensus. These laws will have force in the real world. In addition, these laws can supplement Centralized Law in areas where it falls short, and perhaps gradually start replacing some of its processes.

These developments are in fact a very logical next step in the continuing trend of decentralizing power structures that has been going on for centuries. The next target might well be the State and their multinational organizations. It requires a shift in thinking, and will not happen overnight. But it is coming, and cannot be stopped.

It can be assumed that not everybody in the government will welcome this idea. But neither did the king...