The Birth of Quantum Law
A Concept Paper*

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In late April, 2015, I announced during the final gathering of my course on "Emerging Law Governing Digital Information" that the session was to be my final lecture at a law school. I explained to my students that I could no longer reconcile the intellectual and pragmatic conflicts between the expectations of law schools (and their faculty) that I teach the students the laws and legal reasoning principles of the 20th century and my passion for transferring to the students even a small part of the knowledge and skills they would require to survive, and perhaps even thrive, as digital lawyers in the 21st century.

I explained further that I was also electing to leave the legal profession. Instead, I explained that I was leaving the sight of all which was familiar and declaring a new discipline called "quantum law" for which I was becoming the first practitioner. This concept paper is my first effort to explain the boundaries, dimensions, meaning, and implications of quantum law. The screens and pages to follow will likely annoy, frustrate, and threaten many who are guardians of the status quo. But quantum law is real. Like the Borg in Star Trek, quantum law is already functioning, expanding, and maturing as a force that is transforming how the rule of law, and civil order, will be sustained in the immediate, and not so immediate, future.

Defining Quantum Law

Quantum law can be defined by two fundamental qualities. First, within quantum law, compliance is measured, not judged. An actor, an action, an object, a process, an outcome—the rules of quantum law require each to be defined in such a manner that the attributes of each can be measured and quantitatively expressed. A speed limit on the highway is a simple example. However, information technologies require nothing less. Each keystroke with which this paper is composed is, itself, a measured action. Pressure of insufficient weight on each key will not produce the desired digital image of a letter of the alphabet. The rules against which complex systems are designed, constructed, and operated are no different; merely the mathematics of calculating compliance become more complex.

Second, in the same manner as physicists evolved in our understanding of matter to recognize the quant as the smallest possible unit of matter, quantum law embraces a similar evolution in which we are taking apart our rules, deconstructing them into smaller and smaller units. The desired outcome is to achieve the smallest possible expression of a rule that can be bound to the smallest possible assembly of matter in order to achieve a very specific result—to enable the matter, irrespective of location, to be governed by the rules.

* This paper is a work-in-progress, fully deserving additional footnotes to prior work, particularly in the field of quantum theory and quantum computing. However, for the sake of exposing the ideas, I am following the advice of a sage mentor, "Write the text first, and then add the footnotes." I am deeply grateful to, and acknowledge the influence of Fred Alan Wolf's work, Taking the Quantum Leap.

When the matter is itself organic (such as the author or reader) or tangible (such as a gun or cell phone), the concept can be easily understood even if morally or emotionally uncomfortable. A chip embedded in the ear lobe of a new baby or an RFID tag monitoring the location and usage of a gun are two simple examples. But when the matter is not tangible as such, but composed of bytes and entirely digital, the concept of quantum law becomes far more interesting.

Since more than a decade before the first commercialization of the technologies that have become the Internet, quantum law has been gaining momentum. As Einstein recognized, something must be capable of being defined in order to be measured. Definition of a thing, even a single digital byte, requires something more, information that provides input for man or machine to classify the thing in order to then identify and organize the applicable rules with which that thing is to be used, governed, consumed, transferred, destroyed, or preserved. IT requires nothing less, at every level of complexity. The byte exists; there is information that enables identification and classification; and with that, the rules can be identified and paired to the byte. The same process works for any material object, person, or space with which we interact in our existence.

Quantum law exhibits these two dimensions—the quantitative measurement of the defined attributes of any and all matter—including digital—and the pairing of rules to matter to enable governance. But the rules with which quantum law engages are not laws of nature or the laws of physics—quantum law exclusively embraces those rules authored by humankind or the rules authored by the devices we manufacture and use in our lives. The darkest nightmares and greatest potential for quantum law rests with the development and administration of the rules we author for the governance of digital space. Within those dimensions, we share the challenge of authoring the rules by which we will digitally create, preserve, transfer, process, trade, steal, and destroy the knowledge of humankind.

That is the pivot point for quantum law. Quantum law will enable us to construct the means with which digital information, as an asset with recognized value, can be governed irrespective of its location and irrespective of the structure or lack of structure with which it has been preserved. Quantum law extends that governance so that any other person, entity, device, system, network, or information asset is, in their interactions with the information, also regulated in the actions permitted and prohibited with respect to the information. Stated differently, quantum law envisions the capability to regulate digital information pursuant to the rules applicable to its classification, regardless of the geolocation, IP address, or application at each moment in time. To do so, we must reengineer entirely our concepts of how to construct and sustain the rule of law in order to achieve and preserve civil, social order within a digitally wired, global human population.

Drawing Lines between Quantum Law and Quantum Physics

I am not trained in mathematics; I am certainly not trained in quantum mechanics, quantum theory, or quantum computing. But my initial immersions into the most rudimentary, nearly remedial, introductions to those fields that I have consumed suggest quantum law is nearly unbounded as both an intellectual and pragmatic construct from which to improve our understandings of how to govern digital assets and the full dimensions of cyberspace.

The following is a starting inventory of the connections between the two disciplines, and their implications for the evolution of the rule of law as we know it today.

The Transforming Impact of Observation

For some time, quantum physics has probed the dynamic between the observer and the matter which is being observed. The *observer effect* embraces the notion that the mere act of observation alters the behavior of the observed. While contentious in physics, the concept is radically true in how we administer rules. The supervisor overseeing the production floor from an elevated platform alters the behavior of workers; knowledge you are driving into an announced speed trap alters the pressure of your foot on the accelerator. The same is true within our interactions with digital tools and assets. An employee in a company that prohibits the use of corporate laptops to view pornography usually (but not always) alters their behavior when advised that browser histories are routinely being scanned for inappropriate IP addresses.

In contrast, administration of the rule of law is traditionally reactive. We generally seek to impose sanctions, obtain economic compensation, or limit defined behaviors *after* adversity has occurred. To do so effectively requires enormous resources devoted to reconstructing an accurate portrayal of the reality of what occurred. The first fifteen years of the 21st century have graphically demonstrated the expenditures to do so when the information required is digital. In our enthusiastic adoption of IT and the resulting digital accelerations of human activities, we simply overlooked how important digital information would become to the reactive reconstructions required to administer the rule of law. Oops.

Time and again, the exercise of organizing and synthesizing digital information has overwhelmed the mechanics of the legal systems. Time, competency, resources, access—all have been tested by the poor design and preservation of digital assets that record and preserve the logs of events, transactions, communications, decisions, and all of the other evidential assets used to construct a factual record with which to administer the rules.

Within companies, however, the same inefficiencies have occurred. Challenged in litigation, official enforcement actions, and even in executing internal investigations of possible adversities, businesses have realized that they are nearly incapable of acquiring a single, objective, authoritative record of facts—objective information that can be trusted as documentation of history.

For some, the complexity and costs have been used as barriers to suffering greater sanctions, fines, or other penalties. The corporate cultures, particularly in the 20th century, embraced the potential profitability of non-compliance (measured against the probabilities and costs of someone creating an authoritative record to prove non-compliance). Investing in information governance was actually viewed as undermining the objectives of creating greater wealth for the stakeholders. No one ever would say such a thing, of course, but that was the practical effect.

Rapidly, however, things are shifting. Companies are realizing there is greater profitability in compliance versus non-compliance. The capabilities of IT to discipline processes, control behaviors, assure consistency, improve resource availability, and other great things are really cool. But the real potential of technology that is now being realized is its capacity to observe. Constant, pernicious, invasive, and entirely legitimate observation of the conduct of employees, supervisors, customer service representatives ("this call may be recorded for quality control purposes"), executives, and directors. For each moment, a record can be created that measures whether the behavior conforms to defined rules. For each rule, that behavior must be capable of observation and observations must be capable of being expressed in

measured units. Quality control? Perhaps, but the impact that is far more important is the introduction of the ubiquitous presence of the computer as an observer of the observed.

Recent press coverage of one major financial institution highlighted this line-drawing between quantum law and quantum physics. JP Morgan Chase, after $30 Billion+ in compliance fines and sanctions, reported to its shareholders new expenditures to regulate behavior and improve compliance that included hiring over 2,000 new human assets to better observe the behavior and processes of others. But the follow-on paragraphs explained the IT was the major investment, extending even to controls that monitored keystroke logging on corporate-issued mobile phones to better protect the privacy of customer data, and the suitability of trades, investments, and communications.

As this type of program expands, what is fascinating is that the *same data and records* created by the company to self-regulate compliance also become the evidence of truth required outside the boundaries of the company by those who evaluate compliance. They may be investors scoring the governance qualities of the company, public agencies supervising the presence and use of gender-neutral employment practices, or courts seeking the information required to evaluate claims of negligence in the design of automobile accelerator systems. But all of them have the same ambition—to secure information that records the historical activity within the company to serve as fuel for their evaluations. Each has rules with which that information will be evaluated and rules for measuring the reliability and integrity of the information in conducting those evaluations.

The movement of companies from non-compliance to compliance involves shifting the focus of IT purely from automation of business processes toward the functional role of observing behavior in order to deter non-compliance, as well as detecting non-compliance earlier and enabling earlier intervention, damage control, and remediation. This shift not only serves the corporate interests but also creates information assets with increased value outside the boundaries of the company for those who are, in the final analysis, observing the behavior of the company (and its components, ecosystems, and moving parts).

Much of the science and mathematics of quantum physics now becomes useful to informing how the rules for enabling IT to become an observer are to be authored. Too much observation, generating too much information, and the observation process itself becomes disruptive of that which is being observed. Some brilliant thinking in the development of quantum computing, including the work of John G. Cramer, emphasizes that the act of observation collapses that which is being observed to a single, undeniable fact. Probability mathematics does many things that I still do not understand. For the future of quantum law, however, the mathematics helps determine the actual probability of an event occurring.

That, in itself, is catastrophic to the institutional orientation of the rule of law and our enforcement systems, all designed to be reactive to past events. Calculating probabilities requires ongoing performance data to be gathered by observation. Metrics, rules, and information work together to create a shift toward designing compliance and proper execution into the nervous system of any digital unit—cyberspace, networks, systems, devices, applications, files, records, logs, and, as quantum law evolves, individual keystrokes and bytes. Stated differently, each resource has two functions that fire simultaneously, concurrently, and continually. They perform the work for which they have been designed and they observe themselves performing the work and generate the added records that can be counted, measured, and used to calculate the work has been properly performed *and* document those instances when failure occurs, however granular or atomic the non-conformity.

The results are far more consequential than merely conforming to a posted speed limit. Every process and calculation by a machine, every human interaction with a device or information (including your consumption of this paper in digital form), and every outcome and result of the preceding is being observed and recorded. Thus, the same models and constructs that quantum physics has evolved can be mapped into these interactions among rules, behavior, observations, and the information the observations generate. The outcome is conformity, compliance, and dramatic reductions in the irregularities that are the adverse events that require us to "apply the rule of law" in the first place. Behavior is altered by the acts of observation.

Finally, it is worth emphasizing that the historic division between the public sector and the private sector in acting as observers is also shifting. Begin with the simple illustration of the Environmental Protection Agency installing active sensors at the top of factory smokestacks that measured real-time emissions of various particulates and their volumes. Those measurements produced reporting directly to EPA offices concurrently with the sensor activity. Rather than rely on quarterly emission reports produced by a company, averaging emissions over a specified three months (allowing for non-conforming 'burps' of excessive particulate volumes to be leveled out), real-time reporting resulted in real-time enforcement. Improper volumes were the basis for immediate investigation, and more frequent interventions, fines, and resulting remediation.

What is occurring is important to emphasize. Historically, while governments have been chartered to be observers of corporate behavior, 20th century authorities relied nearly exclusively on recorded information gathered reactively and after the fact to administer the rule of law. Stated differently, the 'cop on the corner' was the rare instance in the interactions between government as an observer and the behavior of society. But that is changing radically in the present time, and with enormous velocity.

Not only are public authorities installing more active "observation" of corporate activities, but they are authoring and enforcing rules that further magnify the active role of technology to be self-observant *and* self-reporting. Public authorities have previously authored regulations that require information included in reports, financial statements, and the like to be structured in certain formats, present specific data, and have human authentications (like corporate officer signatures). The door has now opened toward a new type of regulatory construct in which public authorities are establishing rules governing the structure, design, security, and record-keeping controls for the systems and other components.

Regulation SCI adopted by the US SEC is a terrific example. SCI mandates the systems of brokerages and other entities conform to certain published standards in their design and operation, functioning similarly to building codes for residential homes and office buildings. But there is also an emphasis on the records created evidencing the effectiveness of implementation and management. The SEC is seeking more direct access to information created by observation and, as an external observer, is shifting their presence from a passive, reactive responder toward being directly embedded as an observer inside the systems that are performing the behavior otherwise regulated by the SEC.

Doing so creates greater utility for the information produced; there is less time required by government to validate the information that has recorded behavior and, in turn, greater velocity with which to respond to the information itself as evidence of conformity or non-conformity. This is not a 'back-door' approach; instead, it is direct, real-time observation. There is no question the observed behavior is being affected.

Some governments also include physical presence of human resources inside corporate walls. Financial institutions, notably those "too big to fail", routinely house government observers on a full time basis. Recently, China announced that it was requiring major commercial service providers, irrespective of their industry, to allow on-site government information security personnel to be present, creating even stronger, more intimate interactions between the behavior being observed and the observer. But perhaps the more interesting adaptation is the immediacy of access to the records of the behavior. Some physicists contend information about matter is always present, but its presence is not known and it cannot be recorded until the act of observation occurs. The same is true here and quantum law gains velocity.

Those who 'practice' law are seeing the penumbra of their responsibilities (and their influence) rapidly shrink. Many different tasks and activities associated with 'reactive' observation are disappearing—interviewing witnesses, gathering information, sorting and filtering the information, tagging and quarantining attorney-client communications, etc. None of these are relevant within the broad expanse of quantum law. The actions of observing behavior, and the act of recording what occurs within the behavior, have become concurrent with the behavior. The digital 'witness' has become integrated to the tools used to perform the behavior.

Alternative Realities

Since the early 1600s, as advocates, lawyers have sought to manipulate the records of past events, and the sources of those records (including human witnesses). 'Reactive' law has required this—a single, unified version of historical events must be constructed as the 'record' to be considered under the rule of law. There is no need to discuss the infirmities and weaknesses of the process. Multiple jurors, rules of evidence, exclusions of written documents as hearsay, multiple witnesses with contrasting recollections—all of these are the tools of the advocate to shape, carve, and present a version of what occurred that is best aligned to the interests of their clients.

Modern e-discovery tools are merely more sophisticated versions of using magnifying glasses to find needles in a haystack. The advocate has the responsibility, depending on their role and client, to look closely, use a less powerful glass, and perhaps find other pieces of hay that resemble the needle, with the hope the hay is acceptable as the needle itself. But, in our legal systems today, the rule of law cannot process alternative versions of historical records—there is a singular composition required. When that is not possible, justice is imperfect or, in some cases, impossible to execute at all.

Quantum physics is intensely focused on the existence of different realities and the manner in which those realities gain shape and evolve with the passage of time. But my readings of the disagreements and theoretical battles about possible states and realities provoked me to begin to explore how the rule of law might respond and the implications for quantum law.

David Mitchell's character in Cloud Atlas confronted this issue, expressing the view, "Truth is singular. Its 'versions' are mistruths." As the machines evolve toward becoming the more dominant, and likely far more reliable, witness of events, creating logs and recordations that are simultaneously secured and authenticated into permanent documentation, there is less and less room in which lawyers have the opportunity to craft mistruths to be offered as truth. The funny quality of machines, even in quantum computing, is their inherent insistence on one truth, boiled down to a "1" or a "0". Indeed, to operate correctly, the flow of information as input must be specific, precise, and unambiguous. It is no surprise, therefore, that the output exhibits similar attributes. The interactions among rules, information, input,

and output are fascinating to consider, but the consequences are blunt: for every behavior, including the motion of a single byte within a complex system, there are rules that govern the behavior and explicit, mandatory metrics required to record its behavior. The output becomes the singular truth required for operations to continue.

Where all of this gets even more interesting is when quantum computing and mathematics turn their attention toward the future, powering probability calculations that reduce the uncertainty of knowing what will actually happen next and communicate to the moving parts how to improve the certainty of conforming future behavior to prescribed descriptions of desired outcomes. Compliance executives are doing this every day; quantum law (powered by quantum computing) completely changes the scale and efficacy of doing so.

The machines are not only creating a singular record of the past; they are working more and more effectively to regulate conduct in the future to conform to the outcomes, each measured in granularity and with precision not possible within the current constructs of the rule of law. In Wolf's book, he offers that the calculation of probability effectively can be characterized as an 'offer' with which the future communicates backwards. Imagine my shock to discover this is termed a *transactional interpretation* of how different realities bond together to create a singularity.

As a commercial contracts lawyer, I have said for years that the Internet was merely a massive contract engine, with each transmission of data being predicated by a complex series of offers and acceptances. I had never realized how quantum computing has evolved so far beyond. But it is so very cool to consider—if the input data enables a machine to calculate a probability that behavior about to be executed will be non-conforming to defined rules, the machine can course-adjust by calculating the variables requiring adaptation, producing a 'future' that conforms to the intended outcomes and a singular, authentic record of that behavior.

The Uncertainty Principle

Early work toward quantum mechanics began with Aristotle and Zeno studying the motion of objects and the related paradoxes. Yet only the last century or so has yielded the integrating constructs that are so important to today's world. There is still much work to do; scientists still do battle on whether the universe is composed of particles (the smallest unit of which is a quant) or waves, or both, or something else. But the Heisenberg Uncertainty Principle, as a law of physics, is profoundly important.

For any particle of matter, there are two attributes important to measuring mechanics of that particle—position and momentum. How big, where and how fast? Heisenberg concluded that, in attempting to measure either position or momentum, there would be uncertainty in the measurement of the other attribute. Calculating position would leave momentum imprecise and vice-versa. Indeed, research shows that the order in which each value is measured can influence the measurement outcomes.

At the quant level (think really, really, really small), scientists work to reduce the uncertainty that is the unknown that keeps probability from being calculated at 1.00. At the same time, they battle to avoid allowing the act of observation to alter the behavior of the particles being observed!

In my work to figure out digital trust, I have concluded there are two attributes for digital information that are similar. Quantum law will embrace, and already is embracing, authoring the rules for the information

to be gathered to allow effective measurement of these attributes (and conformity and non-conformity), while also not directly affecting the behavior of the information.

The first attribute of value is the trust value of the information (something for which I have coined the unimaginative notation *T-Info*). Digital information, fundamentally, is a resource or tool we employ to do work. That work may be tasks, behaviors, calculations, record-keeping, etc. When a person (or a machine acting as their proxy) seeks information to perform work, T-Info is the resource that is required. Based on the nature of the work, the quality of trust in a specific T-Info must be measured before the asset can be used to complete the work. After all, who would try to perform work requiring information if they could not trust the accuracy, reliability, and provenance of the information?

In Achieving Digital Trust: The New Rules for Business at the Speed of Light, I presented the tools for designing and achieving T-Info. But that work ended where this paper continues. As a particle of mass accelerates toward the speed of light, something fantastic happens. The mass attracts mass; it becomes larger. I submit, under the Velocity Principle (presented in the preceding book in detail), the same phenomenon occurs with T-Info. As T-Info accelerates across systems, devices, processes, and in and out of files and records, all toward presentation of outcomes useful to the work we ask technology (and the information to perform), there is a point where trust attracts trust. Whether it is a single byte or something larger, quantum law will enable us to define and measure that point where digital information gains T-Info value. There are interactions among the data, the rules governing the data, and the velocity that must be better defined and measured but the concept is clear.

The probability mathematicians and quants already are making great progress at calculating when information cannot be relied upon, but I submit their work begins with a misplaced assumption that digital information can presume to be trusted. That notion is also expanded upon in my book. The key understanding is that the mathematics with which quantum mechanics measured the realities of mass attracting mass can be adapted to begin to calculate, and mature, our understanding of the "package" that achieves the greatest possible velocity.

A single byte requires two added objects of information to be paired. Unlike a single quant, a byte itself, without more, has no expressed value. The two additions are: a classification and a pairing of the rules that govern that byte, based on the classification and an identification and classification of the surrounding context, work to be performed, available resources, etc. Quantum law involves deconstructing the rules into some data object of the smallest possible size that can be paired to a byte (or larger data object) to enable its governance.

The new USB port standard actually already takes a step in that direction. Under the new standard, inbound content includes in the header a classification of the related bytes to follow. A movie may be given lower priority than an IM message from a designated sender—the rules can be authored into the port itself. The same process simply needs to be duplicated and enhanced across each exchange point through which data travels.

Imagine how we could affirmatively calculate T-Info if the machines were able to query and generate the provenance and rules required to make those calculations concurrently with the act of observing the data's arrival and potential implementation in performing work. Statutes, regulations, standards, corporate policies and procedures, access controls, edit controls, governance and retention rules—all of

these are already being migrated from being applied 'reactively' after the data comes into existence and into a designated system toward the front end.

Each exchange point is no different than an immigration officer at any port of entry through which we cross as human beings. The provenance of the data is interrogated no differently than our passports and, in today's world, the supplemental digital data accessible to the immigration officer. What is occurring is a calculation of trust.

The second attribute is the economic valuation of the data. Globally, we now recognize that digital information has become a new form of property, the value of which is discovered when the data is offered in any exchange of value for other property including, of course, other data. A critical variable in calculating economic value is the value of T-Info for any specific data. The greater the T-Info (when measured against the rules of the party acquiring the data), the more likely there is greater economic value and vice-versa. Knowing the economic value of data is going to directly influence the transactional calculation of value offered in exchange. The barter can include any type of property or rights; what is required is only that the economic value of each side of a transaction can be expressed and measured in a common denominator (e.g. dollars, yen, dinar, bitcoin, etc.)

Quantum law will allow us to adapt the mathematics of quantum mechanics to build measurements of these values with greater specificity. I submit that these two values are, however, also subject to the Uncertainty Principle. If we stop data in motion to calculate its T-Info value or its economic value, that act is one of observation that inherently disrupts what is being observed and the resulting calculations.

Why is this important to the rule of law? As machines gain further presence in all of our human processes, 'governance' as part of our social compact will evolve toward greater and greater controls that find their foundation in quantum law. We will use technology to design information with higher T-Info values and, in turn, greater economic values. But there will always be a level of uncertainty—no information can be trusted at an absolute level of 1.00. Quantum law will allow us to author our rules to anticipate that possibility with improved confidence and, in turn, apply our rules with greater accuracy.

The Divisible Whole

In imagining this paper, I had not planned to address the notion of the Divisible Whole. But an announcement in the second week of September by the CFTC (regulating commodities markets in the United States) changed my plans. Concerned by the increased use and volumes associated with machine-based trading, the CFTC expressed an intent to begin regulating the use of algorithms in executing trading activities. The announcement is stunning in several respects (intrusion, surveillance, and the use of metrics-based calculations of compliance are quickly apparent) but the point I find intriguing is the near-casual first appearance of quantum law in formal public laws.

In physics and quantum mechanics, scientists work to break things down. Wolf provides the simple illustration of a person in a running race from the start line to the finish line. We see the runner start and finish, but do we really see their motion from here to there?

In many respects, the rule of law that has carried into the first decades of the 20th century is characterized by the same query. We know what the sausage must be like when offered for sale, and the rules with which we inspect the sausage, but we don't really know how it went from hoof to plate (and recent disclosures regarding the content of hamburgers suggests what happens when we do gain transparency!).

So many of the regulations which govern human behavior have been crafted with an intentional ambiguity that allows judging the full wholeness of a system, an organization, or a specific business process rather than dividing the whole and authoring rules for the parts.

But the preceding variables (observation, single truth, certainty and uncertainty) are only viable metaphors when we *do* divide the whole and begin to author rules that apply to smaller and smaller data objects (and their surrounding processes). In the last couple of years, the SEC has been migrating domestic corporate reporting toward XBRL, a language that allows data to have semantic meaning by wrapping the data in what is essentially a classification. Once classified via XBRL, that data can then be paired to the relevant rules, both for assuring accurate and adequate reporting and, more importantly, for fueling comparative analyses to find patterns and anomalies. Indeed, XBRL improves the T-Info and economic value of corporate information, which is exactly what the CFTC understands.

Automated, algorithm-driven trading requires information from the market and rules with which that information is evaluated. The calculations inform whether to buy or sell. The CFTC also reports that some machines are getting so good they can "bluff" the market (my characterization, not that of the CFTC)—the machines can calculate the probabilities of how the larger market may respond, place an order that induces other machines to place orders, then withdraw the originating order and trade against the market to benefit, all within milliseconds of time.

In stepping into the potential to author rules governing the use of algorithms, the CFTC is dividing the whole! They are actually anticipating how to write prescriptive and permissive rules that, at the machine level, will regulate when specific trades occur, the amount of time that must pass between an order and a withdrawn order, perhaps even the level of certainty of probability with which a trade may or may not be initiated (e.g., "Algorithms may not calculate probabilities beyond 0.0001% certainty"). Of course, these types of rules can *only* be administered through real-time observation, real-time documentation of compliance, and constant surveillance and recordation by systems that must be trusted to create record which will serve as the 'one truth' on which the rule of law will rely.

So, perhaps quantum law is already real. I submit, simply, that is where we are now headed as a species and as a global community. To assure the quality of the sausage, we are demanding transparency into every step, regulating every data asset, and, as we do so, creating enormous inventories of information capable of transforming how we measure wealth and transact commerce.

The Greek proverb states, "A state grows strong when old men plant trees the shade of which they will never enjoy." I am now, if not old, nearly so. Current and future generations must now embrace these concepts and first expressions of principles and move them forward. Lawyers must find the way to work with coders; coders must find the way to work with lawyers and the powers of nation-states. As a community, we must use the technology to evolve the rule of law into something that endures and benefits humankind for the duration of the Digital Age we have begun.

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All comments and criticisms are welcomed. You may contact me at jeffrey@jeffreyritter.com.

