M E M O R A N D U M

To: The Senate Committee on Economic Development, Housing and General Affairs

From: Oliver R. Goodenough, Professor and Executive Director of the Center for Legal Innovation, Vermont Law School

Re: Making Vermont's Legal Structure Hospitable to e-Commerce

Date: April 1, 2015

This memorandum will provide background and a summary for my testimony to the Committee on April 1, 2005.

A hospitable legal environment can help to encourage economic development, often at little or no cost to the state that creates it. Being *known* as such an environment can contribute to creating the buzz that can draw technological enterprise. Both are worthwhile. Vermont in general and Burlington in particular have a growing recognition as a tech development hot-spot. Supportive legal infrastructure can make it even hotter.

In the past, I have been part of initiatives to create flexibility in our business organization laws to make them adaptable to digital firm formation and administration. These laws were and remain among the most advanced treatment of this subject, and they created interest within and without Vermont at the time. Our initiative is described in some detail in the attached chapter from the Kauffman Foundation book *Rules for Growth*. Disappointingly, the implementation steps necessary to capitalize on this initiative were incomplete, due, in part to legacy computing challenges in the Secretary of State's office. And frustratingly, Nevada has moved to implement the Harvard-developed software originally targeted for Vermont, with significant uptake through its web portal.

Recent developments in software and e-security techniques make it worthwhile revisiting this initiative and to consider complimentary law changes that could help our local tech entrepreneurs and make Vermont an attractive jurisdiction for a wide range of e-commerce. A lesson from our prior initiatives is that follow up by the state, the Bar, and software developers is important to make the law possibilities easily adoptable and a success. The Vermont Secretary of State's office has improved its technological interface significantly over the past few years. The Online Business Service Center is a good entry portal, and we are poised there to be able to compete. One of the considerations in making the suggestions set out below is the potential in many of them for bringing energy and resources from the private sector to this implementation.

I deeply appreciate the invitation from the Committee to present some of my thoughts on where good initiatives may exist for Vermont. The intersection of law and technology as a spur to

innovation and economic development is at the heart of my own research and is the focus of Vermont Law School's Center for Legal Innovation. The opportunity to work with the Legislature on this topic is very welcome to me and my colleagues. What I set out below summarizes some of the short and longer term initiatives that I believe are worth your consideration. I remind you that the views I express are my own, and do not reflect those of either the Vermont Law School or the Office of Financial Research of the U.S. Department of the Treasury, where I also consult as a researcher on some of these matters.

A. Immediate Action Possibilities

1. Blockchain Technology Recognition

A piece of low hanging fruit would be recognition of blockchain technology as a means of verification. The blockchain is a decentralized authentication procedure that stores information in a network of "nodes" which makes the information extremely secure and stable. The blockchain can be used in many contexts, including property registries, currency allocations, contract verification, the "internet of things," and business organization participation. While its pioneers include somewhat controversial applications like Bitcoin, its promise is for all kinds of mainstream uses, a promise confirmed in recent Bank of England releases referenced below. One application often discussed is running the participation registry and record for a digital business entity. This would be a direct enhancement of the digital corporation rules Vermont has already adopted.

Blockchain technology is attracting a great deal of interest and investment, as attested in the material referenced below. Last week I attended a conference at Stanford, attended by a couple of hundred people, focusing on the blockchain. It became quickly apparent that formal legal recognition of the verification power of the technology could push this forward, and that a jurisdiction providing this recognition could become the locus for much of the activity and development. In consultation with other lawyers and law professors at this meeting, I drafted a proposed piece of legislation for such recognition, which I attach for the Committee's consideration. This legislation is designed to be a neutral acknowledgement of the evidentiary power of a valid blockchain ledger; it is not intended to legitimize any particular use of the blockchain. If the legislature wishes to move forward in considering such a measure, I and VLS would be happy help with further education and discussion.

2. General e-Contract Recognition

Significant progress is being made in systems that will permit the statement of contractual obligations in software. This ranges from academic work such as my co-authored paper with Mark Flood of the Treasury's office of financial research to the application work of companies like Etherium and Exari. Vermont has already explicitly recognized this possibility in its digital corporation legislation. Extending this principle to other contexts would again make Vermont a leader in the field. For instance, a new paragraph 4 could be added to § 2-204 of Chapter 2 of Title 9A, the Uniform Commercial Code provisions on sales, to read:

> "4. A contract for sale may be stored or depicted in any tangible or electronic medium, and may incorporate some or all of the processes of performance in such medium."

3. Software Initiatives and Promoting Vermont's Legal Structure

Several years ago, when I first began to investigate computable legal structures, we initiated an academic project at the Harvard Law Lab to create software that could implement the potential of the digital LLC enabled by the Vermont law reforms. At the time, we could stimulate only limited interest in the private sector. Times have changed on this, and there is now interest in companies large and small in developing software for digital firms and digital contracting. At the recent blockchain conference, I was able to rekindle interest and knowledge of Vermont as a venue for digital corporation and LLC formation; there is a renewed opportunity for publicizing our status. Passing an additional law at this stage on a matter like the blockchain could provide a "news hook" for such promotion.

4. Better Coordination of Government, Academia, and the Private Sector

Over the past few years, the Secretary of State's office has made significant progress with its Online Business Services Center portal, including the critical step of formation. Further collaboration and coordination among government (including other departments), the bar, academia and the private sector could help bear fruit. Government can be a convener for this, with little out of pocket cost, but it does need to have a champion or two in place to help bring it about.

B. Possibilities for Future Law Change

In addition to the matters that the Legislature could consider for immediate action, I raise three possibilities for law change to begin thinking about. Further convening around these issues, both at the legislative and agency levels, could be useful precursors to more definitive action.

1. Robots and Other Autonomous Agents

The legal structure for managing and governing robots and other autonomous agents is a hot area of discussion in the tech world. I am part of a loose group of scholars and technologists working on an outline for this, with an early goal tying it to state corporation law. Having a safe harbor oversight doctrine for the owners and managers of a "robo-corp" could create the zone of expectation in which this technology could grow. Having Vermont be the locus for this could be a significant step in the direction of bringing a portion of this growing industry to us. If the Vermont Legislature were interested in pursuing this possibility, I and VLS would be happy to be part of that process.

2. Law Practice Rule Reform

The rules which govern the structure of legal practice is the subject of intense discussion. The LegalZoom ads now ubiquitous on the radio are just one symptom of that. While the courts and the Bar typically have the lead role in this conversation, the legislature may also play a part. There are possible avenues for Vermont to gain a larger piece of the national legal industry by getting out in front on this. We anticipate engaging the courts and the Bar more fully around possibilities for this, but we also want to flag it with the Committee as an area where law and technology can come together to create economic activity and jobs.

3. Administrative, Judicial and Legislative Procedure Automation

At VLS we are in the early stages of a project to develop a tool kit for computer and mobile device applications that would allow the building of governmental operation interfaces for administrative, judicial and legislative procedure automation. Vermont already has portions of these processes automated. We would welcome that opportunity to work with representatives of State and local government around this project.

C. Getting the Word Out and Making Applications Happen

As suggested above, adopting an enabling legal structure is only one of the necessary steps – getting the word out and sparking adoption are also keys. Players in these efforts include partners within Vermont, such as lawyers, our technology companies, our universities, colleges, and other non-profits, and our state and local government. All of these can play a role. Beyond that, we need to get attention beyond Vermont. Enlisting our national and international spokespeople into making this innovation a part of their message would be a step in the right direction as well.

Adoption of our laws and structures is also facilitated by the creation of applications that people can use, both in traditional paper-based forms and in the software forms that will be the way of the future. Vermont Law School hopes to work with the Bar, the emerging legal technology community and others to make some of this happen.

Finally, Vermont Law School and its Center for Legal Innovation would welcome the opportunity to be part of fee-based design activity when the State undertakes process automation projects. The mixed record of such projects, ranging from court automation to health care suggests that adding a layer of expertise about the combination of law, government and technology to the mix could be useful – and VLS would be happy to be of service in such a context.

D. Attachments

1. Draft Vermont Blockchain Enabling Law

ORG Version 1.5 – March 31, 2015

a. Blockchain technology shall be a recognized practice for the verification of a fact or record, and those facts or records established through a valid blockchain process shall have a presumption of validity for matters to be determined subject to, or in accordance with, the laws of the State of Vermont.

b. For the purposes of this section, "blockchain technology" shall mean a mathematically secured, chronological, and decentralized consensus ledger or database, whether maintained via internet interaction, peer to peer networks, or otherwise.

c. Without limitation, the presumption established in this section shall apply to blockchain practices for the verification of:

(i) contractual parties, provisions, execution, effective dates and status;

(ii) the ownership, assignment, negotiation and transfer of money, property, contracts, instruments and other legal rights and duties;

(iii) identity, participation and status in the formation, management, record keeping and governance of business or non-profit organizations and associations;

(iv) identity, participation and status for interactions in private transactions and with governmental authorities;

(v) the authenticity or integrity of a document, data, or other information, whether publicly or privately relevant; and

(vi) the authenticity or integrity of records of communication.

d. The provisions of this section shall not:

(i) create or negate an obligation or duty for any private or public entity to adopt or otherwise implement blockchain technology for any purpose authorized hereunder; or

(ii) create or negate the legality or authorization for any particular underlying activity whose practices or data are verified through the application of blockchain technology.

E. Selected Background References:

1. Digital Corporations and Contracting

a. Kauffman *Rules for Growth* book – See Chapter 14

http://www.kauffman.org/~/media/kauffman_org/research%20reports%20and%20covers/2011/02/rulesforgrowth.pdf

b. Oliver Goodenough Co-Authored Paper on Computational Contracting

http://financialresearch.gov/working-papers/files/OFRwp-2015-04_Contract-as-Automaton-The-Computational-Representation-of-Financial-Agreements.pdf

2. Blockchain

a. Blockchain validity

http://www.bankofengland.co.uk/publications/Documents/quarterlybulletin/2014/qb14q3digitalcurrenciesbitcoin1.pdf

https://www.khanacademy.org/economics-finance-domain/core-finance/money-and-banking/bitcoin/v/bitcoin-what-is-it

http://papers.ssrn.com/sol3/Papers.cfm?abstract_id=2499397

http://fmt.cs.utwente.nl/files/sprojects/268.pdf

b. Blockchain commerce and the internet of things

http://www.forbes.com/sites/anthonykosner/2014/12/31/tech-2015-block-chain-will-break-free-from-bitcoin-to-power-distributed-apps/

http://lawprofessors.typepad.com/files/blockchain-article.pdf

https://www.stellar.org/

http://www.businessinsider.com/25-most-exciting-bitcoin-startups-in-the-world-ethereum-21-coinbase-coindesk-2015-3

http://www.vcpost.com/articles/49060/20150313/ibm-looking-adopting-bitcoin-technology-major-currencies.htm

http://www.zdnet.com/article/is-blockchain-the-key-to-the-internet-of-things-ibm-and-samsung-think-it-might-just-be/

d. Blockchain currency bibliographic resource

http://www.digitalcurrencycouncil.com/library/