

# The Future is Here- The Convergence of AI, Blockchain & Quantum Computing with the Law

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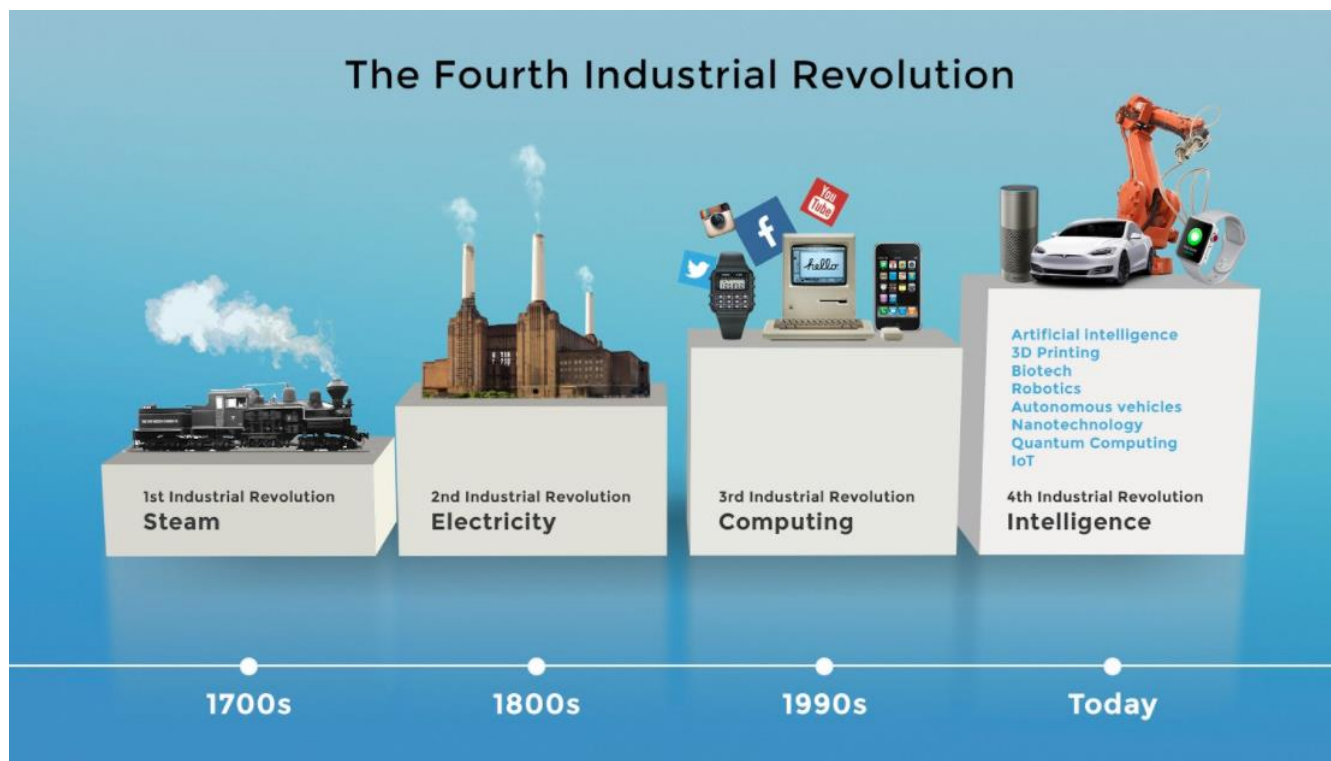
Do AI, Blockchain and Quantum Computing deliver as much as they promise? When at least AI and Blockchain serve as tools that augment human capabilities, they become critical to today's and tomorrow's law practice.

Shawna Hoffman, Global Co-Leader of the IBM Cognitive Legal Practice, opened the second session of ALT. Shawna's achievements include her present positions as Co-Leader, Global Cognitive Legal Practice at IBM, Co-Founder, Diversity in Blockchain, Co-Chair, U.S. Commodity Futures Trading Commission (CFTC) Distributed Ledger. She is one of the inventors on a recently granted patent, "Detecting Clusters and Relationships in Large Data Sets." These techniques help the cutting-edge Deep Machine Learning components of Artificial Intelligence address the huge volumes of Big Data in a world filled with connected computers.

## I. Presentation

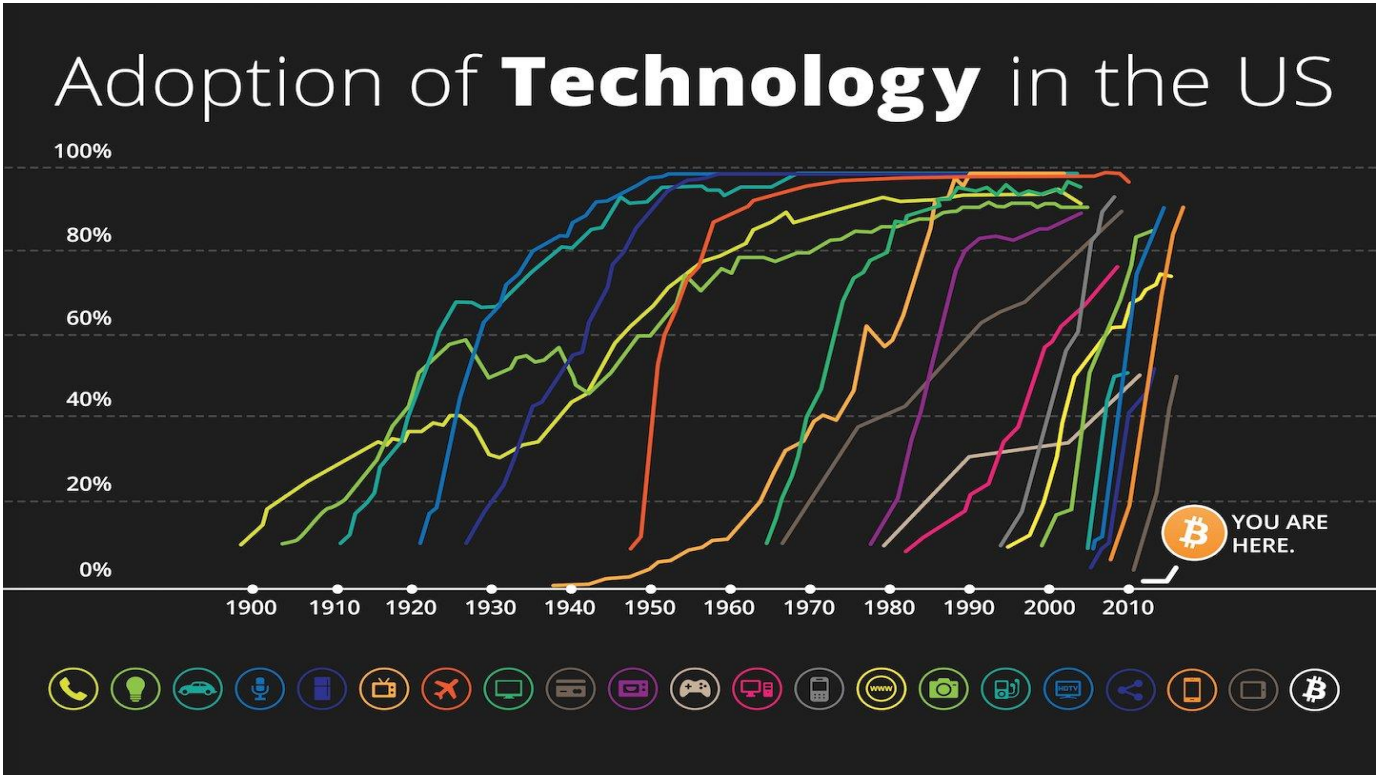
Shawna Hoffman's keynote address presented a very strong picture of the promise and possibilities of artificial intelligence and blockchain to support legal practice.

Building on the capabilities of the IBM Watson systems that reached championship level performance at chess and Jeopardy, Hoffman described capabilities that can have significant impact. She cited the concept of the "Fourth Industrial Revolution", labelled "Intelligence" in her presentation.



<sup>1</sup> Unless otherwise noted, the illustrations are from Shawna Hoffman's presentation.

She illustrated the duration and rates of adoption of technologies over the 20<sup>th</sup> century and the beginning of this century. The technologies of the early 20<sup>th</sup> century took decades to be fully deployed and adopted into personal and business life. The technologies of the 21<sup>st</sup> century are being deployed and fully adopted in years.



Artificial intelligence and blockchain, the most recent technology on the chart, is only at the beginning of its ascent. If it follows the steep curve of recent major technologies such as digital photography, HDTV and smartphones, significant further progress can be expected very rapidly.

Examples she cited for anticipated advance include autonomous vehicles, and (even) flying cars. She pegged 2023 for widespread availability of autonomous vehicles.

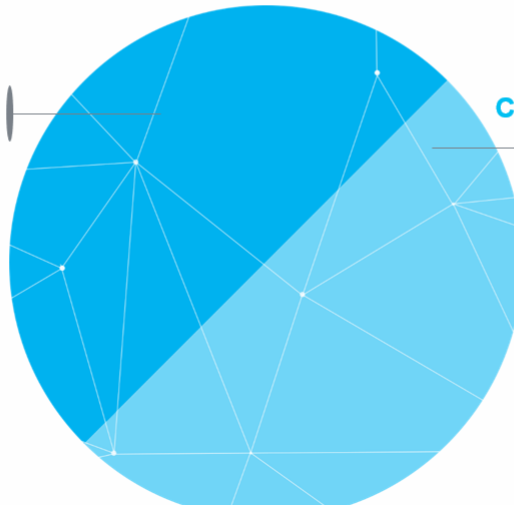
The advances in computational capabilities and methods that enable artificial intelligence to have been accompanied by very rapid increases in the amount of data being stored and readily available, whether within a business, a law practice, or throughout the world. The speed and volume of connections has grown as fast or more rapidly than the computation power of the computers themselves.

The result - an array of capabilities of humans and machines.

# A.I. forges a new partnership between man and machine.

## Humans excel at:

Common Sense  
Morals  
Imagination  
Compassion  
Abstraction  
Dilemmas  
Dreaming  
Generalization



## Cognitive Systems excel at:

Locating Knowledge  
Pattern Identification  
Machine Learning  
Eliminate Bias  
Endless Capacity

The promise of AI:



## Understands

Like humans do

## Reasons

to extract ideas

## Learns

From past results

## Interacts

In a natural way

With the connections and computational power, come the questions of rules of operation and trust among the connected people and entities.

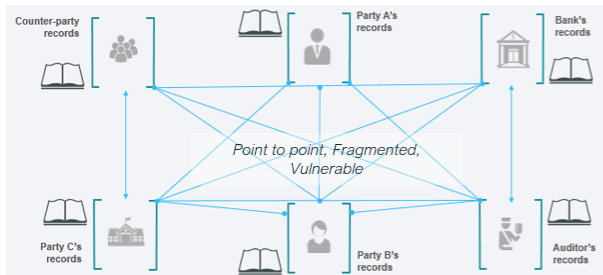
IBM has articulated three principles of trust transparency for A.I.:

- The purpose of AI is to augment human intelligence
- Data and insights belong to their creator
- New technology, including AI systems, must be transparent and explainable

Blockchain has created a mechanism for a network of trust, based on the common / mutual commitment of participants, rather than governance by an authority.

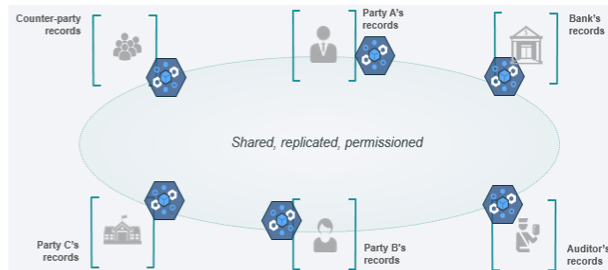
## Blockchain Explained

### Yesterday's Network...

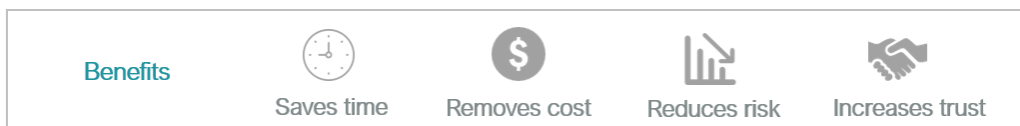


...inefficient, expensive, vulnerable, lack of transparency

### Today and Tomorrow's Network...



...consensus, provenance, immutability, trust in a single source of truth



## II. Analysis

IBM believes that the real value in AI lies in its ability to augment – not replace – human expertise, skills, and cognitive abilities, which is why ... we advocate for new approaches to skills education. We are also committed to the protection of our clients' data: both data and the insights derived from that data always belong to the individual client that generated it. We also think that new technologies, including AI, must be transparent and explainable: technology companies must be clear about who trains their AI systems, what data was used in that training and, most importantly, what went into the algorithm's recommendations. IBM also believes that while bias can never be fully eliminated, and our work to eliminate it will never be fully complete, we and all companies advancing AI have an obligation to address it proactively.

<https://www.ibm.com/blogs/watson/2019/02/serving-society-ethically-in-the-age-of-artificial-intelligence/>

This quote introduces many key issues that should be addressed in assessing and implementing A.I. in law practice. Responding during the ALT Talk to Shawna Hoffman's slide stating that the A.I. "Understands like humans do" and "Reasons to extract ideas," I described the computer systems as "mental exoskeletons" - amplifiers of human thought, but not themselves "thinkers" in the way or to the degree that we ascribe to human beings, no less lawyers.

Recent books and articles frequently pierce the bubble of Homo Sapiens as a species uniquely capable of thought. Sy Montgomery, in "The Soul of the Octopus," found behavior that she could not separate from the human experience of thought in creatures with nervous systems far different than ours. The orcas illustrated by Zach Abramowitz corralled and consumed seals, demonstrating planning and action well beyond hunger stimulus and response. "The highest level of joint intentionality in the animal kingdom is perhaps achieved by killer whales." de Waal, Frans. Are We Smart Enough to Know How Smart Animals Are? (p. 190). W. W. Norton & Company. Kindle Edition.

We can avoid some of the confusion of language avoiding terms like "understand" and "reason." The spectrum of cognition can incorporate human beings, other organisms and "deep learning networks." Consider calling the A.I. and Deep Learning systems "computational cognition."

From the theorists of computational cognition, we learn that recent advances have exceeded the possibilities of programmed instruction, called Turing Machines after the work of Alan Turing, computer science pioneer.

Recurrent neural networks that can adapt and learn based on the environment also have the super-Turing computational power, while networks that learn from a training set and are then frozen, and do not learn from their actual experience while they operate, are no more than Turing machines. However, our brains must continue to adapt to changing conditions, making us super-Turing. How this is done while maintaining previous knowledge and skills is an unsolved problem.

Sejnowski, Terrence J.. *The Deep Learning Revolution* (The MIT Press) (Kindle Locations 3876-3879). The MIT Press. Kindle Edition.

We may not be there yet. We have come a long way.

To the concept of “mental exoskeleton,” consider the current state of commercial exoskeletons. From a report posted on BreakingDefense.com on March 18, 2019, [“SOCOM Tests Sarcos Exoskeleton \(No, It Isn’t ‘Iron Man’\).”](#) The post describes tests by the Special Forces Command (SOCOM) of an exoskeleton that assists in (literally) heavyweight logistics. An earlier attempt to build a powered armor suit has been set aside as impractical. The key developments were weight reductions and other power-saving features that made the devices practical to power and wear. “Anything that lets troops lift 200 pounds over and over for hours without getting exhausted or injured is a potential godsend for support troops who have to, say, manhandle missiles onto helicopter launch racks, wrangle heavy fuel hoses, or lift broken engine parts out of vehicles.”

We can see a similar kind of augmentation of lawyer’s skills and capabilities in the application of machine learning to contract review. These tools had their origin in Technology Assisted Review for ediscovery. Contract Review brings A.I. beyond litigation, and, assists lawyers in a broader range of legal services.

Review of a large number of contracts may be required in legal engagements such as due diligence for M&A, securities issuance, real estate and lending. Similar work may also be required in corporate contract management. Frequently in these engagements, it is necessary to identify whether specific clauses appear in contracts, and to characterize the clauses. An example would be a change of control provision. Several structured facts need to be extracted from the contracts, including names of parties, payment amounts and dates, termination dates and renewal dates.

For these types of engagements, significant numbers of hours may be expended, often by junior associates, to cover the number of contracts, especially in transactions with significant time pressures. Machine learning enabled contract review tools, such as those from Kira Systems, Luminance, and Diligen employ recent advances in machine learning to search, gather, discriminate, present, and manage the review of provisions of large numbers of contracts. In these respects, the contracts review systems automate tasks that had been performed by lawyers and paralegal staff by reading, searching, marking, posting results and tracking progress. That work may have been recorded in tools such as Microsoft Word documents and Excel spreadsheets, or in more sophisticated databases.

A law practice does not just purchase one of these tools, turn it on, and have another billable attorney. The tools depend on a great deal of lawyer and data scientist work, particularly to construct and test the models that enable the tools to detect, distinguish, present, and link content from a collection in a form and format that permits an attorney to complete a review of a body of contracts, for example, in a much shorter amount of time and to a higher degree of accuracy (for those tasks) than the lawyer would without the tools. Computational cognition also avoids the errors introduced by boredom or weariness.



### III. ALT – Talk

The panel for the ALT Talk section included Bob Blacksberg, Principal of Blacksberg Associates, LLC, Anna McGrane Chief Operating Officer & Co-founder, PacerPro, Ron Warman, Partner, Affinity Consulting Group, and Stephanie Corey, Co-founder & General Partner, UpLevel Ops, LLC; Co-founder, Corporate Legal Operations Consortium (CLOC).

The goal of the ALT Talk section was to raise questions that could complement and balance the (optimism of the) keynote presentation. Bob Blacksberg raised three questions for the group:

- To what extent do users of Artificial Intelligence and Machine Learning systems need to understand how the “Black Box” works?
- What practical implementations of A.I. or Machine Learning have you implemented or participated?
- What guidance can we give on effective combinations of Human + Machine to take advantage of these systems?

Stephanie shared examples of use of A.I. today. In everyday use, the digital assistants Siri, Alexa, Spotify and Google Home all employ aspects of A.I. and machine learning.

Examples from law practice include:

- [Allstate Insurance’s Lia](#) system.
- [Eva](#) by Ross Intelligence which analyzes legal briefs
- Commercial lease review at J.P. Morgan
- Ebilling and invoice review & analysis

The shifts in work enabled by the partnership of human lawyers and A.I. / Machine Learning tools can yield more interesting work for the human lawyers and new teams of lawyers and associated professionals. We can expect legal service teams to include hybrid roles, such as data scientists, knowledge engineers, management operations consultants, process analyst, project managers, risk manager and pricing specialists.

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