

Dark Future Precedents: Science Fiction, Futurism and Law

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Abstract. In the next decade a collection of technological and biological advances will enable incredible breakthroughs. These advances will also reveal perils, threats and problems that have yet to be imagined. In the legal domain strategic passivity may be the tradition, but it will only become more expensive. Disruptive global trends in innovation and technological development, increased needs for artificial and natural catastrophe risk management, and more complex domestic and transnational regulatory ecologies make reactivity impractical. Futurism, long term strategic foresight and particularly futurecasting paired with science fiction prototyping are effective tools to model and begin exploring these possible futures and their implications. The intersection of science fiction, futurism and the law gives firms the tools to not only imagine and understand possible futures but also lays out the specific steps that clients need to take to be ready for the complex legal and business realities that are coming.

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Introduction

We are living in a science fiction future. As we enter the next decade the size of meaningful computational power will approach zero in size and volume. Currently, labs are producing microprocessors that are 5 nanometers in size—that’s about 12 atoms across. From these tiny processors to the accelerating dissemination of super computers our world will be filled with computational intelligence.

It is possible that in a not too distant future of smart cities, autonomous transportation, industrial strength artificial intelligence (AI), data mining, ubiquitous connectivity and intelligent environments we will essentially be living inside of computers. Homes, business parks, metropolitan corridors and even the planet will have the ability to sense and compute. This future has gone by many names, arguably the most popular coming from Mark Weiser’s vision of ubiquitous computing. [1]

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More recently commentators have called it the Internet of Things (IoT), but the reality of our future goes much further than that.

In 2013 researchers at the Hinxton, U.K.-based European Bioinformatics Institute (EBI) inscribed all one hundred fifty-four of Shakespeare's into DNA as binary 1s and 0's. [2] They also included an audio clip from Dr. Martin Luther King, Jr.'s "I Have A Dream" speech, a copy of Watson and Crick's famous article on DNA, and, for good measure, a photo of EBI. The researchers then stored this information in DNA and re-encoded it back to binary with 100% accuracy. The experiment served as a striking proof of concept: living organisms can be used as hard drives.

The *Journal Nature* reported that "DNA storage should be apocalypse-proof. After a hypothetical global disaster, future generations might eventually find the stores and be able to read them. 'They'd quickly notice that this isn't DNA like anything they've seen.' Says (Nick) Goldman"[3]

In this one act and many that have followed researchers have vaporized the barrier between the digital and biological world. University research labs and corporate product development departments will be able to program anything, giving us a world where every *thing* will have the ability to compute, sense and communicate.

This may sound like science fiction, but it's a plausible near-term future that could soon be a reality.

How do researchers and professionals make sense of these coming futures? How can companies, civil society organizations and governmental agencies identify opportunities and prepare for threats? Futurism, long term strategic foresight and particularly futurecasting and science fiction prototyping are effective tools to model and begin investigating these possible futures and their implications. In this paper we will explore how futurecasting and science fiction prototyping can work together to identify, model and interrogate these possible futures. Additionally, we will apply these processes to firms, explain how they can become more future-centric and describe how they can provide their clients a broader range of services by identifying dark future precedents.

1. Futurecasting Process Overview

Futurecasting is a process for developing actionable visions for the future. Combining a variety of disparate inputs, including social science, technical research, economics, trend analysis, cultural history, qualitative domain expert interviews and science fiction, futurecasting models what it will feel like to be a human and live ten, fifteen or even twenty years into the future.

Futurecasting produces effects-based models. These models do not attempt to describe the future of a specific product, organization or condition. Futurecasting describes the desired *effect* that an organization might like to see realized or manifested in a decade's time. Conversely, depending upon the research inputs, the organization can also model the possible negative futures or effects that could occur. From these effects-based models it is possible to examine multiple outcomes and a spectrum of futures. These futures can be useful for organizations who are active in complex, difficult to characterize markets and regulatory environments.

Once these futures have been developed, it's possible to "turn around" and backcast, exploring the specific steps that need to be taken to get to these futures and avoid the negative outcomes. Futurecasting identifies the steps or "gates" that

organizations can take to today, tomorrow and several years from now to actively shape their future.

The process can also identify the “flag” or events that could occur independent of the organization’s actions, but that will nonetheless meaningfully impact the futures that have been modeled. Traditional forms of scenario planning can be used to dive deeper into the implications and actions that could occur from these events.

Ultimately the futurecasting process (see Figure 1.) combines a wide range of disparate research inputs, provides a framework to synthesize these inputs and develops multiple effects-based models. These models describe a range of experiences that a person, organization or actor could have in the future. These futures can and should span a spectrum running between the poles of the desirable and the undesirable. Using these defined futures, it is possible to then describe specific actions that an organization would need to take to both achieve or avoid these futures. Additionally, the futurecasting process gives organizations a framework to understand new or unexpected inputs and events, providing them a map to understand the possible impacts.

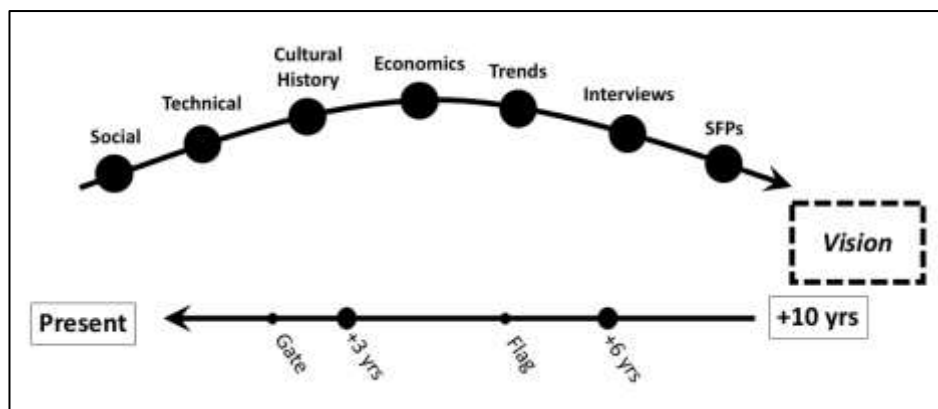


Figure 1. Futurecasting process, illustrating the disparate inputs, futures creation and backcasting with specific actions (gates) and uncontrollable events (flags).

2. Science Fiction Prototyping Overview

The core methodology of Science Fiction Prototyping (SFP) incorporates creative arts (for example, science fiction stories, comics, movies, art installations) as a means of introducing innovation into scientific and engineering practices, business activities and policymaking. The goal of the process is not to forecast or predict the future. SFPs focus on inventing or imaging a possible future by exploring trends from research and futurecasting.

SFPs allow organizations to investigate the human impacts that have been identified through the futurecasting process. SFPs can scrutinize the political, ethical, legal and business impacts of these futures. To do this the SFP process follows a simple set of rules.

All stories have similar ingredients that drive the narrative, making them engaging enough for the reader to suspend disbelief. Whether it be literature, motion pictures or comic books all stories or narratives contain:

1. A person;
2. a scene (place); and
3. a set of problems.

These three elements, when based upon the disparate inputs of futurecasting as well as the effects-based models that come from the process, provide the data to consider a wide range of impacts on culture, technology and economics.

Building from this framework of three core elements of narrative, the SFP process uses five basic steps to assemble the narrative for each prototype (see Figure 2.).

1. Pick Your Science and Build Your World
2. Identify the Scientific Inflection Point
3. Consider the reciprocal interactions of the innovation and society
4. Identify the Human Inflection Point
5. Reflect on What Did We Learn? [4]

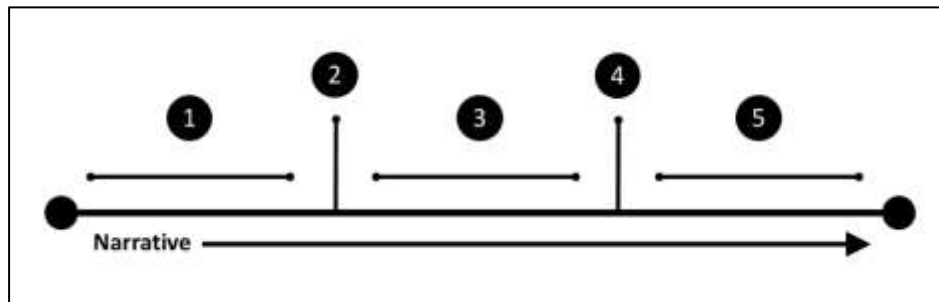


Figure 2. Diagram of the 5 Step SFP process

After examining the details of the narrative based on these five steps, the SFP practitioner can uncover specifics and nuanced outcomes that generally do not come from traditional scenario planning [5], day-in-the-life scenarios [6] or participatory design practices. [7] These sometime subtle, often complex dramatized futures derived from futurecasting can generate significant insights into near- and mid-range futures that firms and clients will ultimately experience. In addition to spurring anticipatory nimbleness, these types of exercises regularly generate concrete means of increasing an organization's value proposition to its clientele.

3. Futurecasting, Science Fiction Prototypes and Law

Why have professional and legal communities remained so allergic to cultivating, exercising and applying their imaginations in practical ways? Even after the global economic crisis of 2007/2008 fundamentally transformed the global practice of law [8] and effectively decimated enrollments at most American law schools. In the decade from 2004 to 2014 there has been approximately a 50% drop in enrollment in law schools. Most law firms and law schools remain stuck in rearview mirror mode. They

typically react to external events and global trends with minimal creativity is their dominant long term approach. [9]

Strategic passivity may be the legal world's tradition, but it will only become more expensive. Disruptive global trends in innovation and technological development, increased needs for artificial and natural catastrophe risk management, and more complex domestic and transnational regulatory ecologies make reactivity impractical, possibly even self-destructive.

For these reasons, the global legal industry is a particularly interesting site for the deployment of futurecasting and SFPs. Big Law, as well as medium-sized firms, boutiques and in-house counsel operations can benefit from an internal use of these methods, as well as from their integration into the services these entities currently provide to clients.

The application of futurecasting and SFPs reveals a wide array of areas where law firms and practitioners can prepare for possible futures. Specifically, it can be applied to challengingly turbulent, radically uncertain scenarios for a broad swath of clients and industries. These dark future precedents can serve as thought experiments that are relevant to various aspects of legal service, including: risk modeling and catastrophe management; intellectual property valuation and advisement ranging from patenting strategies and prosecution to public image consultation to trade secret protection; long-term contract drafting strategies for complex industry ecologies; toxic tort and other complex litigation strategies; high-value and esoteric-asset-based estate planning; and regulatory compliance in dynamic legal environments.

3.1. Dark Future Precedents: A Thought Experiment

The following is a list of possible dark future precedents that can serve as thought experiments for how futurecasting and SFPs could be applied to turbulent, hyper-risky possible futures.

- **The Machines Inside You**

Computational intelligence and the minimization of machines have progressed to the point that organizations, corporations and information technologists can turn anything into a computer. What happens when these organizations and individuals can turn the human body into a computer? Is there a tomorrow in which there are more machines inside the human body than outside in the world?

- **A.I. Malpractice:**

Do you trust your computer more than your doctor? What happens when AIs starts to make medical diagnosis and communicating unsupervised with patients? How far does "self-diagnosis" go when a patient is working in tandem with an AI?

- **Supertanker Logistics SNAFU:**

Self-driving cars. Crewless supertankers. Delivery drones. The age of autonomous transportation of people and goods is just over the horizon. But what happens when these systems fail? How many different places can they

fail? Could we reach the point where autonomous shipping via land and sea malfunctions and reduces the global supply chain to its knees?

- **When Smart Cities make Stupid Decisions:**

At the intersection of Smart Cities and AI we could find metropolitan regions that can change and adapt to the power, resource and security needs of its population. Also at this intersection we might find a lot of misinformation, bad data and even stupid decisions. What happens when smart cities fail, infrastructure collapses and citizens are harmed?

- **World War Robot**

Robots. Drones. Artificial Intelligence. The world is rapidly moving to a state where machines will fight battles for countries. But is this a future where no human life is lost in conflict while robots can spread war across the globe?

- **Live Forever**

Calico. Cytegen. Human Longevity Inc. These are all science and research organizations that believe they can enable humans to live 150 years, 200 years or possibly even defer death all together. Have life science researchers found the fountain of youth? Could the human species cheat death? What would the world look like if no one died? Who would be born? Might these developments signal the approach of a final generation of humans?"

- **The Human Organ Farm**

A child is born with a rare heart defect. Without a transplant the baby will die. Genomic science and biotechnology have progressed to the point where it will be possible to grow human organs inside pigs and sheep. Would a company grow the baby a new heart? Will individuals soon prepare for a time when their heart or liver fails? Where would these human organ-growing animals live and how much would society be willing to rely on these chimeras? Would we stop at growing organs? Would we sanction growing entire embryos within such modified animals?

- **Space 2100**

Imagine humans reach Mars in 2030. They began mining asteroids long before that. Private space travel is no longer the hobby of the mega-rich. It is now time for humans to take that one giant step from the Earth and begin living, working and making money in space. But how do we address the coming legal issues? Who, if anyone, owns the property rights on interplanetary or interstellar materials (e.g. comets)? Who should take the responsibility for derelict space junk? Who will insure these emerging space industries such as tourism, mining and energy production.

These likely future events cannot be effectively dealt with after the fact. Legal practitioners need to anticipate them: neither law firms nor their clients can maintain retroactively oriented approaches to doing business and expect to survive, much less

prosper. And the legal academy, too, must become nimbler in its approach to addressing significant events that have not happened yet.

A few within the legal profession are starting to realize that firms and practitioners need to find new approaches and services to prepare for the changes coming in the next decade. Tony Williams was the managing director at Clifford Chance and when interviewed about this subject in the April 2016 edition of *The American Lawyer* commented: “Law firms have frankly been pretty poor at making investments in their core business, let alone developing areas outside the law, but they’re beginning to recognize that if you just stick to legal advice, you’re missing out on a lot of opportunities...The more differentiation you have, the less you have to compete purely on price. Firms aren’t necessarily making huge investments [in nonlegal businesses] at this stage, but there seems to be much more of a willingness to experiment.” [10]

A small number of radical, client-centric firms show signs shifting to a future-oriented stance. For example, a few firms now offer “law-plus” services [11] that aim to proactively shape the regulatory ecologies within which clients are active. And as more clients realize the commodity-like nature of basic legal services, other firms are recognizing the value bump to clients that advisement followed by forward-looking implementation assistance offers over advisement alone.

The genuinely innovative law firm, however, will meld legal consultancy and forecasting. This new type of firm will be as active in the legal industry as it is in the futures industry.

We see the new future-centric legal venture having four critical traits:

1. Mixes the professional disciplines of law and futurecasting;
2. Helps clients understand the legal and business implications of actions in the past, present and across a range of plausible future scenarios;
3. Provides clients with analytical tools and frameworks that enable them to realize desirable futures; and
4. Gives clients and the firm a shared language to discuss these possible futures and concrete guidance as to how to move towards their realization

4. Conclusion

Isaac Asimov, the legendary author of both science fiction and factual essays, noted that “Predicting the future is a hopeless, thankless task, with ridicule to begin with and, all too often, scorn to end with.” Precise prediction *is* a fool’s game, but preparations for multiple desirable futures is the vocation of the wise. The combination of science fiction, futurism and legal practice offers firms valuable new additions to their conventional toolbox. This new approach to advisement allows clients to not only systematically imagine and understand possible futures, but to also delineate specific preparatory steps that clients need to take before their already complex legal and business environments become even more so.

References

- [1] M. Weiser, "Ubiquitous Computing", *Computer*, vol.26, no. 10, pp. 71-72, October 1993, doi:10.1109/2.237456
- [2] N. Goldman, et al. Nature <http://dx.doi.org/10.1038/nature11875> 2013.
- [3] E. Jong, Yong, Nature. <http://www.nature.com/news/synthetic-double-helix-faithfully-stores-shakespeare-s-sonnets-1.12279> 2013.
- [4] B.D. Johnson, *Science Fiction Prototyping: Designing the Future with Science Fiction*. Morgan & Claypool. 2010
- [5] P. Schwartz. *The Art of the Long View*. Doubleday, 1991.
- [6] K. Go and J. M. Carroll, "The blind men and the elephant: Views of scenario-based system design," *interactions*, vol. 11, no. 6, pp. 44–53, 2004
- [7] S. Schuler and A. Namioka. *Participatory Design: Principles and Practices*. Lawrence Erlbaum Associates. 1993.
- [8] Eli Wald, *The Economic Downturn and the Legal Profession*, Foreword: *The Great Recession and the Legal Profession*, 78 *Fordham L. Rev.* 2051 (2010)
- [9] M. Bennett, *A Critical Embracing of the Digital Lawyer.*" *Educating the Digital Lawyer*, Oliver Goodenough and Marc Lauritsen, eds., LexisNexis (2012).
- [10] C Johnson. *Outside the Box*. *American Lawyer*. April 2016.
- [11] K. Polantz. *The Price of Influence*. *American Lawyer*, Dec. 2015.