



Department of Justice
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Justice Trends 2: Automated Justice Get the Gist of the future for technology in justice

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Shaping Tomorrow

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What is a Gist report?

Shaping Tomorrow¹ uses an AI-driven, systems thinking model to deliver strategic foresight and predictions. These are presented in Foresight Gists, which are 5-10 page briefs that provide a broad view of a topic with only the most essential information using auto-extracted indicators (they provide the ‘gist’ of a topic). Gists include an introduction to a topic, a literature review and a suggested framework for scenario development.

Introduction

In 2015, Shaping Tomorrow explored trends in justice through a gist report that looked primarily at the three major shifts expected to affect the justice system and the legal industry: rapid shifts in the economy, society, and technology. In the three years since that first gist, these shifts, especially technology, continue to have an impact on the justice system.

This 2018 gist provides a focus on automation technologies and how they are expected to affect justice in the future. The six factors the first gist identified—new business models, access to law, client empowerment, increased competition, legal profession shifts, and technology and digital disruption—continue to shape the future of justice and the court system. However, they are converging and changing especially as automation technologies advance.

This gist takes a high level view of the trends. The purpose of the gist is to stimulate thinking within the reader’s own organization about how different scenarios might look for the future of justice. Organizations are encouraged to consider potential trends so that they can plan for the future.

Automating Justice

Information Technologies (IT) have developed to the point where automation is affecting knowledge sector work both positively and negatively. Here is a list of useful terms:

Machine learning: the programming of algorithms to allow a machine to “learn” from the information it is given. The more algorithms a machine is modified with and the more information it is given, the more complexity it can develop. Some machines are programmed with specific instructions for finding a certain type of answer. In deep learning, which is used by self-driving cars and photo recognition, the machine is built to replicate the human brain and filter information without specific instructions. Deep learning uses algorithms that learn from

¹ Shaping Tomorrow is a research and analysis service that aims to anticipate trends.

experience just as people learn from practising a task². They perform tasks repeatedly, tweaking the performance a little each time to modify or improve the outcome.

Cognitive computing: a term coined by IBM's researchers who merged cognitive science with deep learning, computer vision, and different fields to increase the complexity of the artificial intelligence. IBM's Watson, which won on Jeopardy, is the quintessential example.

Blockchain:³ one of the digital technologies that pundits promise will have a huge impact on the legal industry. Bitcoin and other cryptocurrencies are based on some form of blockchain technology. The blockchain stores data in an immutable ledger that is decentralized from banks, governments, or any single entity. It promises improved transparency for transactions. Blockchain technology does not have to be public, but it can still improve transparency within a closed system. It can underpin smart contracts, which are systems of conditional exchanges, in a transparent and decentralized manner. It is decentralized by relying on the consensus of its users.

Smart contracts: codes that allow an exchange once pre-set conditions are met (i.e., if this happens, then that happens). Smart contracts are largely what is driving the so-called 'Internet of Things'.⁴ If a homeowner's car is within 10km of home, then the lights turn on and the heating/ air conditioning is optimized. However, smart contracts can also act based on information provided in a blockchain to automate tasks.

Predictive policing: when law enforcement identifies criminal activity using mathematical, predictive, and analytical techniques. The Los Angeles Police Department (LAPD) has started using predictive policing to predict where crime might occur so that they can direct scarce resources to such locations. However, critics charge that the data the algorithms are using are flawed and will only reinforce racial bias⁵.

Machine learning and cognitive computing have already entered the legal industry and will soon emerge more pervasively in the wider justice system. Blockchain enabled smart contracts (as tools for automation) also have a great deal of potential to affect the justice system as a whole as well as the administration of justice.

Much of the concern commonly expressed in forecasts about automation has centered on the loss of white collar jobs. This assumption relies on extrapolating the effects of automation on

² Marr, Bernard. 1 October 2018. "What Is Deep Learning AI? A Simple Guide With 8 Practical Examples." <https://www.forbes.com/sites/bernardmarr/2018/10/01/what-is-deep-learning-ai-a-simple-guide-with-8-practical-examples/#efa9d2c8d4ba> [Accessed 25 April 2019]

³ Blockchain is the name of a new technology that is a sequence of blocks or groups of transactions that are chained together and distributed among users.

⁴ The 'Internet of Things' refers to the interconnection of computing devices (e.g. PCs, mobile phones, sensors) via the internet which enables them to send and receive data.

⁵ Thomson, Sylvia. 24 September 2018. "'Predictive policing': Law enforcement revolution or just new spin on old biases? Depends who you ask." CBC News. <https://www.cbc.ca/news/world/crime-los-angeles-predictive-policing-algorithms-1.4826030> [Accessed 25 April 2019]

blue collar jobs. Technology usually helps to drop the price of performing certain tasks, but this efficiency has historically enabled society to innovate toward new types of work. Some research suggests that digital automation may actually create more employment in the knowledge sector by enabling greater productivity. What will be the implications for reduced costs and increased productivity in the justice sector? How can technology be used both to increase productivity and further protect civil rights?

Automation will affect several domains from banking to education. In the subsections below, you will see that automation is also entering police work, court and evidence management, the legal profession, and the world of crime.

1. [The current development trajectory of AI will lead to some sort of artificial super-intelligence within the century.](#)
2. [Non-routine tasks – whether manual or cognitive – will still be done by humans while routine tasks – even cognitive ones – will be done by machines.](#)
3. [In Canada between 1.5 million and 7.5 million jobs could be at risk of automation in the next 10 to 15 years.](#)
4. [A quoi cela sert-il d'avoir trente avocats en "data room" alors qu'un robot peut le faire? \[translation\] What is the purpose of having 30 lawyers in a “data room” when a robot could do the work?](#)
5. [If companies were to invest in AI and Human-Machine Collaboration at the same level as the top performing fifth of companies, they could boost revenues by 38 percent and lift employment levels by 10 percent between 2018 and 2022.](#)

General Forecast for the Justice Sector

6. [Avec la simplification de la procédure pénale et de la procédure civile, avec la transformation numérique, l'organisation des juridictions devra nécessairement être repensée.](#) [translation] With the streamlining of the criminal procedure and the civil procedure, given digital transformation, we will need to rethink how jurisdictions are organized.
7. [AI has the potential to improve aspects of the criminal justice system, including crime reporting, policing, bail, sentencing, and parole decisions...while also taking care to minimize the possibility that AI might introduce bias or inaccuracies due to deficiencies in the available data.](#)
 - a. [Federal agencies that use AI-based systems to make or provide decision support for consequential decisions about individuals should take extra care to ensure the efficacy and fairness of those systems, based on evidence-based verification and validation.](#)

Automated Policing

Predictive policing⁶ has been a growing trend for the past few years. However, people concerned about human rights and fairness have raised concern about bias that may be inherent in an automated system. For such practices to be used, it is essential that users recognize and address the bias in the system.

The potential to use machines as automated decision-makers, however, might be limited at this point. These approaches may be no more accurate than human-based decisions and may even introduce further bias into the courtroom. In 2016, *Pro Publica*, an American nonprofit newsroom, reviewed the results of an algorithm used to predict risk and found that it was barely more effective than a coin toss: “Of those deemed likely to re-offend, 61 percent were arrested for any subsequent crimes within two years.”⁷ The algorithm also displayed a disturbing level of racial bias - identifying Black defendants as more likely to commit crime and White defendants as less likely even when all other factors were taken into consideration.

However, AI can be used in other ways. The Invisible Institute’s Citizens Police Data Project⁸ has suggested that data within a police department can be used to identify officers who abuse their authority. If police can figure out how to use new technologies to reduce crime rates, policy makers will need to consider a balance that allow for innovation while maintaining civil rights. Therefore, the forecasts in this section pertain to justice with regards to privacy, bias, profiling, and security.

8. [Now many are buying programs from tech companies like Hitachi and IBM which claim that analyzing big data can predict crime before it happens.](#)
9. [Law-enforcement officials around the world will use AI to spot criminals, but may also snoop on ordinary citizens.](#)
10. [The use of big data in policing has clear benefits for struggling police forces, but society needs to maintain a critical perspective on moral and ethical grounds.](#)
 - a. [Using models of risk as a basis for police decision-making means that those already subject to police attention will become increasingly profiled.](#)
11. [If police can divert resources to the right places and proceed automatically to where police and social workers need to be to help people, it would be a fundamental change in the way they approach crime and violence.](#)
12. [Using computer models to determine where crime is most likely to occur could reinforce police biases about neighbourhoods with ethnic or racial minorities.](#)

⁶ Predictive policing refers to the practice of law enforcement to identify criminal activity using mathematical, predictive, and analytical techniques.

⁷ Angwin, Julia, Jeff Larson, Surya Mattu and Lauren Kirchner. 23 May 2016. “Machine Bias: There’s software used across the country to predict future criminals. And it’s biased against blacks.” *ProPublica*. <https://www.propublica.org/article/machine-bias-risk-assessments-in-criminal-sentencing> [Accessed 8 May 2019]

⁸ Designed to serve as a national model for transparency, the Citizens Police Data Project is the product of a decade-long collaboration with the University of Chicago Law School’s Mandel Legal Aid Clinic.

13. [To achieve even a 5% drop in Chicago’s homicide rate, enormous leaps in both prediction and intervention effectiveness are necessary.](#)
14. [After two especially abominable years of mayhem, Chicago will be a somewhat safer place through 2018 and beyond.](#)

Body Cameras

15. [New capabilities for the cameras could, paradoxically, risk undoing the confidence and trust in the community that cameras are meant to inspire.](#)
 - a. [If body cams themselves undermine people's willingness to talk to cops, then imagine what it would be like if body cameras with live streaming or face recognition were implemented.](#)
 - b. [Bolstered by a growing raft of additional high-tech features, the cameras could allow for a new form of high-definition surveillance, one conducted with few safeguards and little oversight.](#)

Automated Courts

In 2018, Quebec announced that it was launching a \$500-million project to modernize its legal system by digitizing all court files and records so they can be easily compiled and transferred between police, prosecutors and defence lawyers⁹. The project also includes a legal resource kiosk that will assist citizens through their court process and a plan to digitize provincial inmates’ correctional files. Quebec’s digitization programs are taking shape to make court records uniform and accessible. It is hoped that digitized court files and records could be open to big data analysis and machine learning to help the courts become more efficient. The time necessary to process each case could eventually be estimated with increasing accuracy. Information for each case could be more easily searched and machine learning could enable other services. For instance, the system could recommend cases, evidence, or any indexed data to a user. These recommendations might help with case law reviews and lawyerless courts.

The building blocks for a lawyerless, online small claims court system are now being laid in the United Kingdom (UK). In 2018, the UK completed a pilot project allowing people to file divorce petitions online. Over 1,000 petitions were granted during the pilot phase; 91% of applicants expressed satisfaction; and online petitions were less likely than paper versions to be rejected for errors¹⁰. In the UK, algorithms and other IT make the courts more efficient. As the technology advances, a machine might eventually learn to automate a judge’s role. An AI judge

⁹ CBC News. 24 April 2018. “Quebec streamlining court system by ditching paper records: Court records will become uniform, accessible in real time.” <https://www.cbc.ca/news/canada/montreal/quebec-streamlining-court-system-by-ditching-paper-records-1.4633176> [Accessed 8 May 2019]

¹⁰ Rose, Neil. 8 May 2018. “Government rolls out online divorce after successful pilot.” *Legal Futures*. <https://www.legalfutures.co.uk/latest-news/government-rolls-out-online-divorce-after-successful-pilot> [Accessed 8 May 2019]

could be adopted for civil cases with small claims which should free up court staff's time for more complex cases.

Lawyers' Use

16. [Cognitive computing could be used to suggest which arguments in court might play well or badly with a particular judge at a given time of day.](#)

Smart Courts

17. [85% of Britons are connected to the internet, and there is an expectation that legal services should be available online.](#)
18. [Ethical, moral and legal risks from the growing use of algorithms are under the spotlight as the Law Society launches a public policy commission today on the impact of new technology on the justice system.](#)
19. [The first steps towards cyberjustice will naturally involve modelling and reproducing present paper processes using electronic media.](#)
20. [As our courts become increasingly dependent on technology the impact of any disruption to our core business will be increased.](#)
21. [Court users will benefit from real-time case status screens, SMS and other digital notifications of session times.](#)
22. [Information technology may play an important role in increasing access to transitional justice institutions and in facilitating communication between the institutions and their constituencies especially those in remote areas.](#)
23. [A court system could use intelligent software agents working on behalf of their human and physical \(courtroom\) counterparts to automatically and intelligently examine and prioritize individual schedules and dynamically assemble a court docket.](#)
24. [Technology will increase the access, convenience, and ease of use of the courts for all citizens and will enhance the quality of justice by increasing the courts' ability to determine facts and reach a fair decision.](#)

Judicial Prediction

25. [Accepteriez-vous d'être jugés par des algorithmes? \[translation\] Would you accept being judged by an algorithm?](#)
 - a. [Est-ce que la justice est faite pour dire à quelqu'un, à partir de statistiques calculées par une machine, qu'il a toutes les chances de récidiver, ou de lui dire qu'il a la capacité de changer? \[translation\] Is it justice to tell someone, based on machine-calculated statistics, that they are highly likely to re-offend or that they have the ability to change?](#)
26. [An artificial intelligence method developed by University College London computer scientists and associates has predicted the judicial decisions of the European Court of Human Rights \(ECtHR\) with 79% accuracy.](#)

27. [U.S. courts and corrections departments are experimenting with algorithms to determine a defendant's risk to inform decisions about bail, sentencing, and parole.](#)
28. [If used properly, criminal-justice algorithms offer “the chance of a generation, and perhaps a lifetime, to reform sentencing and unwind mass incarceration in a scientific way.”](#)

Blockchain & Smart Contracts

29. [Judicial enforcement of law could be displaced by blockchain technology.](#)
30. [The Ethereum system powering smart contracts itself envisages a dispute resolution mechanism involving external arbitrators and/or courts, where the contract is frozen pending proceedings, and the award of the court is incorporated into the terms of the smart contract.](#)

Automated Evidence

As trends in automation, mobile technology, and eDiscovery converge, legal teams will be able to access evidence wherever they happen to be—court, client offices, etc. A 2014 report by the Technical Working Group on Biological Evidence Preservation (United States Department of Commerce) noted that forensic science laboratories and law enforcement agencies are increasingly using automated identification technology (AIT), such as barcoding and radio frequency identification (RFID), to track and manage forensic evidence, firearms, and personnel¹¹. In future, since many forms of evidence will be digitized, machines could eventually be programmed to suggest particular evidence in real time during court proceedings, client consultations, witness interviews, etc.

31. [Technavio's analysts forecast the global ediscovery software market to grow at a CAGR¹² of 17.36% during the period 2016-2020.](#)
32. [Increased litigation and regulation coupled with expanding use cases for eDiscovery software will continue to drive moderate growth in the worldwide eDiscovery market.](#)
33. [The availability of reliable and effective mechanisms for admitting and displaying digital evidence will have an undoubted impact on the way evidence is gathered.](#)
34. [As a justice system, we need to reach the point where it is expected that a police officer will give evidence by video, taking 10 minutes rather than half of their working day.](#)
35. [New Jersey is developing software that will automatically create risk profiles of people charged with offences.](#)

¹¹ Williams, Shannan, Melissa Taylor, Jeffrey Irland, and Anuj Mehta. November 2014. “RFID Technology in Forensic Evidence Management: An Assessment of Barriers, Benefits, and Costs.” <https://nvlpubs.nist.gov/nistpubs/ir/2014/NIST.IR.8030.pdf> [Accessed 8 May 2019]

¹² CAGR=Compound Annual Growth Rate

Other Evidence Technology

Digital technology is not the only technology improving evidence management and gathering. The three forecasts below are added to provide a broader view of potential changes ahead for the role of evidence in justice. With improved fingerprinting, 3D printed evidence, and DNA extrapolation, evidence could be used in new ways to advance the cause of justice. But, would the technology violate privacy or other civil rights?

36. [Fingerprint technology which can detect the brand of hair gel used by a suspect or whether they have handled a condom, food, or illegal drugs could soon be admissible in court. The technology can also detect the gender of the suspect, and it can differentiate whether the suspect has recently touched the blood of a human or an animal.](#)
37. [Craig Venter asserts that your DNA can be used to create a photo-like reconstruction of you that will allow police to pick suspects out of a lineup using a blood spot.](#)

Automated Attorneys

Automation has several benefits for the legal industry. Recently, a service called [LawGeex¹³](#) was shown to be faster (93 minutes for humans versus 26 seconds for the AI) and more accurate (average of 85% for humans versus 94% for the AI) than human lawyers for reviewing nondisclosure agreements (NDAs). This level of efficiency could increase a firm's profits. Due to the efficiency and improved ways of practising law, lawyers will be able to focus on analysis and improving customer service for their clients. Likewise, they will be able to customize their prices more easily for each client to improve access to legal expertise.

38. [To truly put a law firm in the palm of one's hand, consumers must have access to a dedicated network of law firms that exclusively serve the members of that community and has a track record of excellent performance.](#)
39. [Looking to the Canadian legal marketplace, the following systems and applications present similar disruptive potential:](#)
 - a. [cloud-based services that do intelligent deconstruction of documents to facilitate client engagement about contract creation;](#)
 - b. [legal process and document production portals that enable lawyers to manage document production and document exchange between different parties;](#)
 - c. [technology that enables lawyers to dispense virtual advice through expert systems in areas with risk or complexity, although the questions may be routine or repetitive;](#)
 - d. [crowd sourcing and review sites where individuals choose to review companies instead of registering disputes;](#)
 - e. [teleconferencing and web technologies for remote and online legal services;](#)

¹³ <https://www.lawgeex.com/> [Accessed 8 May 2019]

- f. [greater use of e-filing and other court initiatives such as electronic transcripts.](#)

There is a lot of hype around technology in legal services, particularly in light of a wave of new companies touting software that will “replace the lawyer”. The reality is that technology is still a long way off from replicating the people skills, social awareness and intuition required to make a good lawyer. Rather, the technology we will see in the next 10-15 years is enabling software that helps lawyers, by making their job more efficient and automating repetitive, computable tasks – for example, through predictive electronic discovery, intelligent legal research and automated document preparation.

- 40. [Alors que le gouvernement s'apprête à faire un premier pas vers une justice plus numérique à travers le projet de loi présenté la semaine prochaine, un magistrat et un chercheur au CNRS y consacrent un livre, Justice digitale... Si cette tendance inquiète une partie de la profession, des bouleversements se font déjà sentir, par exemple avec le développement de cabinets d'avocats entièrement en ligne.](#) [translation] While the government is taking a step toward a more digital justice through the bill to be tabled next week, a judge and CNRS researcher have written a book on the subject, Justice digitale [digital justice]. And while some in the profession are worried about this trend, its effects are already being felt, for example, with the creation of fully online law forms.
 - a. [Le projet de loi accorde en effet une place de choix à la transformation numérique, avec le développement de la visioconférence, de la prise de rendez-vous ou saisine en ligne, et le recours grandissant aux legaltech, ces technologies numériques appliquées au monde juridique.](#) [translation] The bill effectively puts digital transformation front and centre, with the development of videoconferences, online appointment booking, and growing reliance on legaltech—digital technologies applied to the legal world.
- 41. [La justice engage sa transformation numérique Objectif de cette transformation: la dématérialisation des procédures, « il faut que les citoyens puissent suivre leurs affaires directement sur Internet ».](#) [translation] Justice is initiating its digital transformation. The objective of the transformation: to dematerialize procedures - "Citizens need to be able to monitor their business directly on the Internet."

Artificial Intelligence

- 42. [Blue Hill Consulting Group conducted a study that compared traditional legal research tools such as Boolean search and natural language search with the ROSS Intelligence AI-supported platform and found that ROSS had better information retrieval quality, with 40 percent more relevant authorities cited, a 30 percent reduction in research time, and an estimated business impact of \\$8,466 to \\$13,067 annual revenue increase per attorney.](#)

43. [ROSS is not a way to replace our attorneys – it is a supplemental tool to help them move faster, learn faster, and continually improve.](#)
44. [Only about 13 per cent of legal work will be taken over by computers within the next five years. So, AI poses less of a threat to legal jobs than some fear, but computers, left unchecked, can have a detrimental impact on the law.](#)
45. [Although AI shows a world with immense potential in the legal arena, it would be highly impossible to replace legal practitioners who are seasoned and can think creatively based on their experience and expertise, while being able to connect with the people as well as be able to use a network to their advantage.](#)

Efficiencies

46. [By 2020, 15% of low-tier, billable legal work will be replaced by smart machines powered by data analytics platforms.](#)
47. [114,000 legal jobs will likely to be automated in the next 20 years.](#)

Concerns for Justice

48. [The State Department foresees privacy concerns, safety of autonomous vehicles, and AI's impact on long-term employment trends as AI-related policy areas to watch in the international context.](#)

Blockchain & Smart Contracts

49. [In the future, we are going to hire hackers to look over a smart contract just like we hire lawyers to look over a contract today.](#)
50. [Blockchain based smart contracts have been increasingly deployed across the finance and property sectors in the last two years and even more widespread adoption is expected in the coming years as greater functionality and common standards emerge.](#)

Automated Crime

Because machine learning works best with large quantities of data, much attention and concern has been centered on data monopolies such as Facebook and Google and how they use or plan to use this data. Another concern should be data criminals who use big data solutions for illegal and unethical purposes. According to an article in Datanami, “cybercriminals are increasingly using advanced analytic tools and techniques to more efficiently mine and monetize stolen data”¹⁴. Criminals are already using automation for online crimes, and they will likely find new ways to exploit data and therefore exploit their victims in both the digital and physical world. As we develop the capacity for AI to be more convincingly human, the potential criminal

¹⁴ Woodie, Alex. 12 October 2016. “Criminals Are Using Big Data Tech, And So Should You.” Datanami. <https://www.datanami.com/2016/10/12/criminals-are-using-big-data-tech-and-so-should-you/> [Accessed 8 May 2019]

implications abound, from weaponizing AI and phishing the phone book with an AI avatar to finding loopholes in the law and police avoidance.

51. [Policymakers should collaborate closely with technical researchers to investigate, prevent, and mitigate potential malicious uses of AI.](#)
52. [The use of AI to automate tasks involved in carrying out attacks with drones and other physical systems \(e.g. through the deployment of autonomous weapons systems\) may expand the threats associated with these attacks. We also expect novel attacks that subvert cyber-physical systems \(e.g. causing autonomous vehicles to crash\) or involve physical systems that it would be infeasible to direct remotely \(e.g. a swarm of thousands of micro-drones\).](#)
53. [The use of AI to automate tasks involved in surveillance \(e.g. analysing mass-collected data\), persuasion \(e.g. creating targeted propaganda\), and deception \(e.g. manipulating videos\) may expand threats associated with privacy invasion and social manipulation. We also expect novel attacks that take advantage of an improved capacity to analyse human behaviours, moods, and beliefs on the basis of available data.](#)
54. [A research fellow at Yale University's Information Society Project is working on a paper that argues robots could be morally responsible and be held criminally liable for their actions, and therefore be subject to "punishment".](#)
55. [The United States and Europe are ill-prepared for the coming wave of "deep fakes" that artificial intelligence could unleash.](#)
56. [To get ahead of the problem, policymakers in Europe and the United States should focus on the coming wave of disruptive technologies.](#)
57. [Fueled by advances in artificial intelligence and decentralized computing, the next generation of disinformation promises to be even more sophisticated.](#)

AI for Virtual Attacks

58. [The costs of attacks may be lowered by the scalable use of AI systems to complete tasks that would ordinarily require human labor, intelligence and expertise. A natural effect would be to expand the set of actors who can carry out particular attacks, the rate at which they can carry out these attacks, and the set of potential targets.](#)
59. [New attacks may arise through the use of AI systems to complete tasks that would be otherwise impractical for humans, and malicious actors may exploit the vulnerabilities of AI systems deployed by defenders.](#)

60. [Attacks enabled by the growing use of AI will likely be especially effective, finely targeted, difficult to attribute, and likely to exploit vulnerabilities in AI systems.](#)
61. [The use of AI to automate tasks involved in carrying out cyberattacks will alleviate the existing tradeoff between the scale and efficacy of attacks which may expand the threat associated with labor-intensive cyberattacks \(such as spear phishing\). We also expect novel attacks that exploit human vulnerabilities \(e.g. through the use of speech synthesis for impersonation\), existing software vulnerabilities \(e.g. through automated hacking\), or the vulnerabilities of AI systems \(e.g. through adversarial examples and data poisoning\).](#)
62. [Cyberattacks powered by artificial intelligence will make prevention more difficult.](#)
63. [Advances in computing power and in theoretical and practical concepts in AI research, as well as breakthroughs in cybersecurity, promise that machine-learning algorithms and techniques will be a key part of cyberdefence - and possibly even attack.](#)
64. [\[Sixty-two percent\] of information-security professionals surveyed by Cylance at Black Hat USA 2017 think that hackers will weaponise AI, and begin using it offensively in 2018.](#)

Automating Economics

The role of automation in economics is continuing to evolve and is expected to continue to drive change. For instance, as the Internet of Things, distributed renewable energy, and autonomous automobiles converge; the management, power, and movement (respectively) of economic activity is expected to be largely fueled by automation. As a result, the relevance for the future of justice is largely centered on concerns over economic inequality despite an improving global economy.

Economic inequality has been shown to lead to inequalities elsewhere such as in prison populations. Whether economic inequality can be considered just or not, its increase is likely to play a key role in the future of justice and the world. It is already driving much of the motivation for a lawyerless court. An article in *Open Democracy UK*, raises questions about the move to remove human interaction from courts; the author wonders if applicants using an online system will get the same 'justice' as those advised by a human lawyer¹⁵.

65. [Speaking at the Canada Growth Summit, Mark Carney said increases in artificial intelligence, big data and high-tech machines could create huge inequalities between](#)

¹⁵ Bindman, Geoffrey. 16 March 2017. "UK government wants to move justice online - but can computers perform essentially human functions?" *Open Democracy UK*. <https://www.opendemocracy.net/uk/geoffrey-bindman/uk-government-wants-to-move-justice-online-but-can-computers-perform-essentially> [Accessed 8 May 2019]

[the high-skilled workers who benefit from the advances and those who are sidelined by them.](#)

66. [The future of global income inequality is likely to be shaped by both convergence forces \(rapid growth in emerging countries\) and divergence forces \(rising inequality within countries\). No one knows which of these forces will dominate and whether these evolutions are sustainable.](#)
67. [The World Economic Forum released a report predicting AI, machine learning, and other nascent technologies will spur a so-called "Fourth Industrial Revolution" that replaces 5.1 million jobs by 2020.](#)
68. [U.S. Supreme Court justices are on record stating that emerging technologies will likely be the biggest legal challenge of the next few decades.](#)
69. [Incontestablement, nos villes et communautés, autant leur composition que leur objectif, évoluent. De plus en plus, l'urbanisation et ses dérivés redéfinissent vos vies, la technologie et les compétences numériques jouant un rôle progressivement plus important.](#) [translation] Our cities and communities are undeniably evolving, in both composition and objectives. Urbanization and similar trends are increasingly redefining our lives, with technology and digital skills playing an increasingly significant role in this regard.

Automating Society

Some of the most significant social issues in society are interrelated and revolve around social media in various ways: targeting specific people/communities, propaganda, privacy, and inclusion.

Targeting

The rise of social media has caused concern about society's willingness to sacrifice privacy for online services. Although social and legal interest in privacy is increasing, advertisers and other content producers have used the lack of privacy to target certain demographics to effect changes in society. In response, in May 2018, Europe passed new privacy legislation called the *General Data Protection Regulation* or GDPR that seeks to ensure that users know, understand, and consent to the data collected about them¹⁶. Some people believe that social media also causes many people to be more distracted and think less deeply about anything else that concerns society outside of an individual's purview¹⁷. Could the complex nature of this echo

¹⁶ Tiku, Nitasha. 19 March 2018. "Europe's New Privacy Law Will Change the Web, and More." <https://www.wired.com/story/europes-new-privacy-law-will-change-the-web-and-more/> [Accessed 8 May 2019]

¹⁷ Simmons, Michael. 2 May 2018. "While Everyone Is Distracted By Social Media, Successful People Double Down On An Underrated Skill." <https://medium.com/accelerated-intelligence/while-everyone-is-distracted-by-social-media-successful-people-double-down-on-a-totally-underrated-5a86701e9a27> [Accessed 8 May 2019]

chamber phenomenon affect social cohesion? If so, what would be the role of the justice system in such circumstances?

70. [Science researchers have developed a new algorithm that uses Flickr photos to accurately predict people's present locations.](#)
71. [The researchers Yilun Wang and Michal Kosinski had built an algorithm that could use facial images to correctly distinguish between gay and heterosexual men in 81% of cases.](#)
72. [Harvard scientists have developed an algorithm that predicts whether a social structure is likely to favor cooperation.](#)
73. [The fear is that social algorithm\[s\] will eventually filter out anything you don't want \[to\] hear, leading to an echo chamber and a pretty dull populace.](#)

Propaganda

Societies often change rapidly after grassroots movements mature, and even grassroots movements are maturing more rapidly thanks to social media. One study looked at how quickly Americans changed their minds on six big issues—interracial marriage, prohibition, women’s suffrage, abortion, same-sex marriage, and recreational marijuana.¹⁸ A primary concern over social media is the proliferation of competing propaganda and misinformation which builds to the point of confusion.

Some of this type of confusion could be clarified as the general public increases its knowledge of the law in order to effect change. Advocates for unfettered free speech worry that concerns over misinformation and fake news could allow governments to pass anti-propaganda legislation that might cross a line and threaten legitimate free speech¹⁹. This may already be happening in countries such as the USA and the Czech Republic. Germany has already started working on ways to combat fake news and algorithms that spread misinformation.²⁰

74. [There are few greater threats to democracy in the world today than the proliferation of fake news and propaganda.](#)
75. [A wave of terrorist attacks in Europe have emphasised the role of online propaganda for the threat from terrorism.](#)
76. [Information warfare and "fake news" have played a prominent role in global politics over the last several years and could dominate the relationship between societies, governments, politicians, and militaries in the future operational environment.](#)

¹⁸ Tribou, Alex, and Keith Collins. 2015. "This Is How Fast America Changes Its Mind."

<https://www.bloomberg.com/graphics/2015-pace-of-social-change/> [Accessed 8 May 2019]

¹⁹ Priday, Richard. 5 April 2018. "Fake news laws are threatening free speech on a global scale." *Wired*.

<https://www.wired.co.uk/article/malaysia-fake-news-law-uk-india-free-speech> [Accessed 8 May 2019]

²⁰ *Time Magazine*. 2017. "Russia Has Launched a Fake News War on Europe. Now Germany Is Fighting Back."

Simon Shuster. <http://time.com/4889471/germany-election-russia-fake-news-angela-merkel/> [Accessed 8 May 2019]

77. [The U.S. government's new "Global Engagement Center" will seek to ensure that the censorship is even more complete with its goal to counter foreign state and non-state propaganda and disinformation.](#)
78. [The risk of netizens obtaining only superficial understandings of issues, the possibility of echo chambers occurring, and the threat posed by fake news underscores significant challenges.](#)

Privacy

Consumers of social media have concerns about propaganda and questions about how large social media companies such as Facebook use their personal data. Public dialogue about the tradeoffs of personal information for services has been ongoing. The issue became more of a public concern when the Facebook-Cambridge Analytica scandal was fully disclosed. Watchdogs have been warning that social media companies have to move beyond data-mining the personal information of their clients.²¹

Facebook released private information on 50 million of its users to Cambridge Analytica which exploited the data with the intention of swaying the US electorate to vote for Donald Trump as president. In truth, nearly all of Facebook's users have had their data 'scraped' by malicious actors.²² It is still too early to tell if users will sustainably change their behaviour on social media to protect their own data. However, Cambridge Analytica has shut its doors,²³ and Facebook is promising to change its policies amid the public uproar.

The social media-induced data exchange could be an ongoing issue with ramifications for the legal industry. For instance, legal teams may have to work harder to find information about their clients and other stakeholders. There could also be an uptick of cases concerning privacy.

79. [71 percent of more than 5,000 consumers polled in the U.S., the U.K. and Australia said they did not want companies to use artificial intelligence that threatens to infringe on their privacy.](#)
80. [Over the next five years, the notion of "privacy" will undergo a radical change, and perhaps what is seen as unethical today will become acceptable tomorrow.](#)
81. [The risks of severely injuring people's lives has prompted New Zealand and the European Union to strengthen privacy laws in ways that significantly limit the use of algorithms for social programs.](#)

²¹ *The Conversation*. 2018. "To serve a free society, social media must evolve beyond data mining." <https://theconversation.com/to-serve-a-free-society-social-media-must-evolve-beyond-data-mining-94704> [Accessed 8 May 2019]

²² *San Francisco News*. 6 April 2018. "Facebook: Most Users Data Scraped By 'Malicious Actors'." <https://sanfrancisco.cbslocal.com/2018/04/06/facebook-most-users-data-scraped-by-malicious-actors/> [Accessed 8 May 2019]

²³ *The Guardian*. "The six weeks that brought Cambridge Analytica down." <https://www.theguardian.com/uk-news/2018/may/03/cambridge-analytica-closing-what-happened-trump-brexit> [Accessed 12 April 2019]

European Union's General Data Protection Regulation

82. [Some privacy advocates hope that the European Union's General Data Protection Regulation, which goes into effect on May 25 \[2018\], will give users - even Americans - greater protections about what data tech firms can collect, how the data can be used, and how consumers can be given more opportunities to see what is happening with their information.](#)
83. [Within hours of the European Union's \(EU\) General Data Protection Regulation \(GDPR\) taking effect on 25 May \[2018\], technology giants Google and Facebook have been hit with privacy complaints that could carry fines of up to \\$9.3 billion in total.](#)
84. [The GDPR will have a negative impact on the development and use of artificial intelligence in Europe.](#)

Discrimination vs. Inclusion

Every individual is different, but recognizing, even celebrating, diversity is very different from developing an inclusive society. The question of social inclusion and social cohesion is relevant because concerns about immigration and diversity (in Canada and internationally)²⁴ have led alt-right, anti-immigrant groups to use increasingly violent rhetoric with potentially inflammatory results. And considering the inherent bias within the police algorithms mentioned above, concerns about discrimination are pertinent. Canada also has concerns over inclusion and social cohesion.²⁵ The rise of alt-right groups will have negative effects on vulnerable groups, such as women, immigrants, Indigenous peoples, racialized minorities, LGBTQ communities, and other minority groups.

In many ways, society is not just categorizing itself but segregating itself. Technology is clearly playing a part, but so are other factors.²⁶ Despite an apparent polarization in politics (especially in the US but also in Canada), society is growing increasingly less binary.

85. [Within 30 years, both the US and UK will be majority-minority societies. Alongside this shift, the way people see themselves is changing: the term "mixed race" is losing relevance, and more nuanced definitions of gender and ethnicity are emerging.](#)
86. [Law school may be the perfect place for women in America to resist, persist, and prove that the future is female.](#)

²⁴ Barmet, Céline. 1 March 2019. "The UN Human Rights Pillar on Shaky Ground." Center for Security Studies (CSS). <http://www.css.ethz.ch/en/services/digital-library/articles/article.html/d333f46c-ce2e-4c4c-aceb-a4d4a378de91> [Accessed 12 April 2019]

²⁵ Levitz, Stephanie. 23 January 2019. "Less than half of Canadians hold optimistic, open view of the world: study." *National Post*. <https://nationalpost.com/news/canada/fewer-than-half-of-canadians-hold-optimistic-open-view-of-the-world-poll> [Accessed 12 April 2019]

²⁶ Boyd, Danah. 2017. "Why America is Self-Segregating." <https://points.datasociety.net/why-america-is-self-segregating-d881a39273ab?gi=9aa9cb2d145e> [Accessed 12 April 2019]

In Canada

87. [Statistics Canada projection to 2036 found the share of Indigenous people in the population will grow as high as 6.1%, from 4.4% in the 2011 census. The total share of immigrants in Canada's population is expected to reach up to 30% by 2036, which would be the highest since 1871.](#)
88. [Over a quarter of the population \(26-30 per cent\) will have a mother tongue other than English or French, up from 20 per cent now.](#)
89. [The first official language spoken will more often be English and less often French \(English, 75 per cent to 78 per cent; French, 23 per cent to 21 per cent\).](#)
90. [The proportion of native-speaker Francophones will fall faster than Anglophones, to 17-18 per cent from 21 per cent now. The French mother tongue population will fall both in Quebec \(from about 80 per cent to about 70 per cent\) and in the rest of Canada \(from 3.8 percent to about 2.8 per cent\).](#)
91. [Indigenous households in Canada are more likely than non-Indigenous households to experience the sociodemographic risk factors associated with household food insecurity \(e.g. extreme poverty, single-motherhood, living in a rental accommodation, and reliance on social assistance\).](#)
92. [By 2034, Canada will face the same challenge Atlantic Canada is currently experiencing - the natural rate of increase will turn negative: Boosting immigration to some 400,000 in the early 2030s will help keep population growth steady at about 1 per cent per year.](#)

Human Resources

93. [Some of Britain's largest companies will need to recruit or promote 40 per cent more women into senior positions if firms are to meet new targets and help make the UK a global leader in gender diversity.](#)
94. [Gartner predicted in a March 2017 research note that by 2020, more than 75% of large enterprises will include features that promote diversity and inclusion in their selection process for HR software.](#)

Summary Analysis

For the next 10 years, the pace of change for the economy and society will continue to be pushed by ever accelerating technological advances. Justice systems will need to keep pace or risk being less relevant to citizens.

In shaping these future changes, it will be key to take advantage of the benefits of technology while protecting society and the justice system from unintended consequences.

For the justice system, the knowledge of industry disruption will be only part of the issue. The more important discussions center around the need to determine the areas where technology

can be used effectively, free from bias. More thought and research will need to be undertaken to determine whether AI and other digital technologies help eradicate human bias from the justice system, or if they will only make the issue worse.

Now that researchers know that prejudice can influence algorithms, researchers must work to improve the code to address or remove the bias.

To address some of these concerns, human lawyers or other justice system stakeholders may be required to act as auditors on the output of AI for many years to prevent potential injustices. These stakeholders will need to improve their skills and move rapidly to stay ahead. Policy makers will need to provide guidelines for how to audit such machines while maintaining security and upholding civil rights.

Digital and technological advances provide an opportunity to make the justice system more coordinated, efficient, and automated (e.g. more seamless flow of information from the police to lawyers and court to restorative justice and jails/prisons) but safeguards are required in these areas to ensure that the guiding principles of justice systems are respected.

The current landscape also provides unprecedented opportunity for courts to effect appropriate and thoughtful adaptation from more traditional approaches to modernized ones. These newer approaches include reducing the number of brick and mortar locations while increasing online services (e.g. Smart Courts) that can better serve citizens who have difficulty travelling. They might also offer extended hours service and may reduce the need for lawyers in some low risk situations.

Governments will need to improve their business model, and develop online platforms and automation services. They will also need to ensure that their employees' technology competency is strong enough to survive and take advantage of the upcoming changes.

Strategic Questions

This section contains a number of human generated and automatically-extracted queries as well as questions that could be considered in strategic planning.

1. The current non-automated system is based on fallible human beings, so how does automation change this equation? Are the checks and balances maintained in the system?
2. The legal industry is based on very binary principles (guilt or innocence, defense or prosecution), but the world is growing increasingly non-binary. Can the legal system be made more inclusive of diverse thinking at a fundamental level? What would a trans-legal system look like? Could such a system be more just than the current system? How

could technology be used to address such a change? How would society respond to the lack of binary preferences?

3. How could organizations or individuals exploit a lawyerless system?
4. How do citizens see the Justice system evolving in the future?
5. How will developments in one country affect others in a global world?

Auto-extracted Questions

6. [Simple évolution technique ou révolution culturelle?](#)
 - a. [La centralisation informatique, une révolution culturelle?](#)
 - b. [L'instauration d' un État Big Brother?](#)
 - c. [Qui pourra avoir accès à quels dossiers?](#)
 - d. [Quand les avocats verront-ils le changement?](#)

[translation] Mere technical evolution or cultural revolution?

Is the centralization of IT a cultural revolution?

The implementation of Big Brother?

Who will be able to access which files?

When will lawyers see change?

7. [If there is no objective dimension to legal knowledge, can there really be justice?](#)
8. [Yet what if a robot judge is hacked? Or if evidence is hacked so as to frame a case or conflict?](#)
9. [What if an increasing constituency in our society chose to believe that the justice system was biased against the new world that they live in and thus chose to reject it and reject the rule of law?](#)
10. [What institutions or mechanisms can help us strike the right balance between maximising the benefits of AI and minimising its security risks?](#)
11. [Can humans \(e.g., witnesses\) better identify subjects they see in video feeds, as opposed to or in addition to static mug shots and lineups? How would implicit biases in how witnesses view video be accounted for?](#)
12. [How can courts address \(the often naturally occurring\) discrepancies between peoples' statements and testimony on the one hand and video and other sensors on the other?](#)
13. [To what extent is access to justice truly improved by cyberjustice when the "digital divide" is taken into account?](#)
14. [How can the risks and hazards systematically produced as part of modernization be prevented, minimized, limited and distributed away so that they neither hamper the modernization process nor exceed the limits of that which is 'tolerable'?](#)

15. La transformation numérique ne doit pas transformer la justice. Digital transformation should not transform justice.
- a. Les chantiers de la justice Numérique, Procédure civile et Réseau des juridictions: le rationnel est-il toujours raisonnable? Work on digital justice, civil procedure and the network of jurisdictions: Is the reasoning still reasonable?
 - b. La justice asservie par le numérique? Does digital constrain justice?
 - c. Faut-il pour autant que chaque justiciable en paie le prix? Does this mean that every litigant pays the price?
 - d. Naturellement, un tel principe est de nature à repenser profondément l'office de la cour d'appel car si les moyens sont figés, comment les prétentions pourraient-elles évoluer? Naturally, such a principle leads to a fundamental rethinking of the function of the Court of Appeal because, if means are frozen, how can claims evolve?
 - e. Dans ces conditions, comment les usagers les plus vulnérables pourront ils avoir accès au droit et le cas échéant au juge? Under these conditions, how can the most vulnerable users have access to justice and, where applicable, to a judge?
 - f. Comment pourront-ils se constituer partie civile et demander réparation de leur préjudice après une agression, saisir le conseil des prud'hommes pour obtenir le paiement de leurs salaires impayés, demander une augmentation de la contribution à l'entretien et à l'éducation de leur enfant, obtenir un droit de visite et d'hébergement de leur enfant après une séparation la mainlevée de leur mesure de tutelle ...? How can users be a civil party and claim compensation for damage suffered after an assault, take their case to the labour courts to obtain payment for unpaid wages, seek an increase in contribution to the care and education of their child, secure visiting and accommodation rights after a separation or termination of their guardianship...?
 - g. Quoi de mieux pour accentuer le déséquilibre par exemple entre un créancier institutionnel demandeur et un débiteur particulier défendeur? What better way to emphasize the imbalance between, for instance, an institutional creditor applicant and an individual debtor respondent?
 - h. Vers qui ou vers quoi se tourneront ceux que ces mesures excluront de l'accès aux juges? Who or what will those whom these measures will exclude from access to judges turn to?
 - i. Elle pose des questions sur le devenir du corps des directeurs des services de greffe: où allons-nous positionner les directeurs de greffe qui ont déjà du mal à exister avec des chefs de juridiction qui sont trop souvent omniprésents? This raises questions about the future of leaders in registry services: Where will we position registry leaders who already have trouble with heads of jurisdiction who too often are everywhere, all the time?

- j. [Qu' en sera-t-il du corps de ces mêmes directeurs s'il y a moins de postes? What will happen to these leaders if there are fewer positions?](#)

Fair Warning?

16. [Is it fair — or even legal — to trick people into talking to an AI system that effectively records all of its conversations?](#)
17. [Should there be a requirement for non-human systems operating online or otherwise interacting with humans \(for example, over the telephone\) to identify themselves as such \(a "Blade Runner law"\) to increase political security?](#)
18. [What are the pros and cons of government policies requiring the use of privacy-preserving machine learning systems or defenses against adversarial examples and other forms of malicious use?](#)

Lawyers

19. [What do clients want now and what will they want in future?](#)
20. [What technological and other external change might affect the services that can be offered and requests demanded by clients?](#)
21. [What, in your view, would a future-proofed law firm look like?](#)
22. [Will software substitute for lawyers, or increase their earning power?](#)

Criminals

23. [Should it come down to inmates to identify flaws in the prison's computer systems?](#)
24. [If machines get smart enough to out-think people what would that mean for cybersecurity?](#)
25. [Could the social engineering techniques we see being used in email scams at the moment be applied to more sophisticated technology like video chat?](#)
26. [..while Google's demonstration highlighted the benign uses of conversational robots, what happens when spammers and scammers get hold of them?](#)
27. [Identity theft is a popular and profitable crime, yet how will its impact grow as justice embraces automation?](#)
28. [How likely is it that the Sharing Economy will play an ever larger role in the economic life of society in the coming decades?](#)