

Analyzing the Pacing Problem and Associated Ethical Controversies

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How does society regulate technological innovation in a way that protects the interests of consumers while also allowing for growth? Recently, society has been experiencing a phenomenon known as “the pacing problem” (Thierer, 2018). The pacing problem refers to the idea that technological innovation increasingly outpaces legislation. With the advent of artificial intelligence, autonomous cars, prosthetic limbs and mobile devices, data is constantly being collected, consumed and dispersed. Most of these technologies and software have been created within the decade, with each new innovation building off of the previous one. Because of this spurred growth, more questions have arisen about how the law should pace itself in order to regulate technological systems in an ethical fashion.

This paper explores the concept of the pacing problem, provides three cases which demonstrate legal-ethical controversies stemming from the problem and presents factors to consider when evaluating a solution. Using the Social Construction of Technology framework, this paper sheds light on how the regulatory environment of technology changes over time based on the needs of consumers and society as a whole.

Background: The Pacing Problem

Citizens want the government to protect them when it comes to their data. Companies oftentimes collect individuals’ private data and distribute it to other third parties as a way to increase profits. Logically, these profits motivate company decisions and actions which may not be in line with the privacy and security needs of customers. Consequently, the government must serve as a gatekeeper to shield consumers from unethical behavior on behalf of corporations. However, the bureaucratic nature of the government makes it difficult to regulate technological

innovation at the pace at which it grows. This section explains the intricacies of the pacing problem and the associated risks.

The pacing problem can be broken down into three subproblems: the external pacing problem, the inter-branch pacing problem and the internal pacing problem (Harris, 2019). The external pacing problem refers to the fact that Congress struggles to pace itself with the speed of technological growth in industry and society. The inter-branch problem explains that Congress lags behind the executive branch and the agencies of government it oversees. Lastly, the internal pacing problem demonstrates that Congress struggles to make effective use of technology in its own operations (Harris, 2019). The three subproblems are distinct but interconnected. This paper will exclusively focus on the external pacing problem, as it lays the foundation for the cases that will be presented.

Congress struggles to keep pace with the speed of technological growth in industry and society. With the rate at which new technologies are being created and adapted, Congress lacks the resources to “adequately anticipate, understand, and act on emerging issues. As a result, legislation on emerging technologies is often out-of-date or redundant by the time [it is] implemented,” (Harris, 2019, para. 9). Laura Manley, Director of Technology and the Public Purpose Project at the Belfer Center, noted that only about 15 percent of the current Congress is trained in technology and that Congress typically defers to technology lobbyists for information when making technical decisions (Milano, 2019). How can Congress respond to the needs of citizens when it lacks the appropriate technological knowledge to make decisions?

Gary Marchant addressed the pacing problem in the conclusion of his book *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight: The Pacing Problem*. Marchant came to the following conclusion: “Existing regulatory systems and ethical

frameworks are inadequate to provide effective, meaningful and timely oversight of the current and future generations of emerging technologies” (Marchant, Allenby, & Herkert, 2011, p. 199). While technology is being developed at a rate faster than ever before, the government’s bureaucratic inertia stalls government responses to the privacy and security demands of consumers. The lag of government oversight behind new technologies has been increasing at an alarming rate, leaving no time to create an enforceable regulatory platform. This causes various legal-ethical controversies to be left up to interpretation. Marchant provided commentary about how emerging technologies pose risks that legislation fails to address effectively:

These technologies are being developed in a new era of public scrutiny and increased role for NGOs, requiring better forms of public engagement that do not yet exist. The lessons from past debacles such as asbestos and chloroflourocarbons (CFCs) have created an imperative to address anticipated rather than known risks, which further stretches our risk assessment and risk management capabilities. These challenges further exacerbate the growing asynchronicity in the pacing of law and ethics with science and technology.

(Marchant, Allenby, & Herkert, 2011)

The pacing problem has various implications in the modern world. The following section addresses complex scenarios in which legislative bodies or company stakeholders have had to ethically resolve problems posed by technology without a legal precedent that prescribes a viable solution.

Ethical Controversies Stemming from a Lack of Legal Precedent in Technological Systems

Data has become one of the most valuable resources from an economic and social perspective. With sites being able to track consumer purchasing behaviors to governments being able to protect citizens from crime, the scope and magnitude of the information available from data has been immeasurable. However, with big benefits, come big concerns. When data that is collected ends up compromising a person's privacy, what qualifies as crossing the line? The three cases presented shed light on the controversial problems faced by technological systems due to a lack of legal precedent. Following this section, the Social Construction of Technology framework will be used to evaluate these ethical dilemmas and provide a structure for analysis.

Case 1: Facebook's Beacon Software (2007)

Facebook created Beacon to track users' actions on sites other than Facebook and allow targeted advertisements for friends in their networks. Set up as a way for other third-party vendors to attract business, Beacon paved the way for personalized advertisements in the marketing world. From Facebook's perspective, Beacon seemed to be an extremely valuable asset to its business. Facebook would have a whole new stream of revenue from partnering with the 44 companies who agreed to the deal ("Leading Websites Offer Facebook Beacon for Social Distribution," 2007). The companies bought into the concept of Beacon because they would be able to take advantage of social networks to advertise their products or services which would tremendously improve their sales. However, when advertisements spoiled peoples' holiday presents and people realized their privacy had been exploited, Facebook users were not thrilled and Beacon began to spiral downward.

An article published by the New York Times explained how Beacon worked. Basically, "Under Beacon, when Facebook members purchase movie tickets on Fandango.com, for

example, Facebook sends a notice about what movie they are seeing in the News Feed on all of their friends' pages" (Story & Stone, 2007, para. 20). Users were not informed that Facebook had tracked their data on participating websites and broadcasted their searches to the friends in their network nor were they given the option to opt-out of data transmission. This made Beacon highly problematic and controversial.

As individuals and civic action groups learned of the major privacy concerns with Facebook's Beacon, various petitions were created. MoveOn.org, one such protest group, created a petition called "Facebook, stop invading my privacy!" and called for an opt-out button for Beacon as part of Facebook's privacy policy (Greenberg, 2007). This petition gained support from over 50,000 Facebook members within ten days (Story & Stone, 2007). Many Facebook users felt betrayed by Beacon because sharing personal data without consent compromised their own right to privacy. Annie Kadala, a 23-year old student at the University of North Carolina at Chapel Hill, stated, "Just because I use a Web site, doesn't mean I want to tell my friends about it," (Story & Stone, 2007, para. 24). **Because Beacon presented one of the first instances of targeted online advertisement systems, there was no legal precedent to handle the invasion of privacy that occurred.**

Case 2: Facebook's 'Emotional Contagion Study' (2014)

In Facebook's Emotional Contagion Study, Adam D.I. Kramer, a data scientist at Facebook, led the effort with Jamie E. Guillory and Jeffrey T. Hancock, two academics, to manipulate the content on over 689,000 Facebook users' news feeds for a week to assess the impact on users' emotions, (Jouhki, Lauk, Penttinen, Sormanen, & Uskali, 2016). The experiment tested whether emotional contagion would occur as a result of manipulated newsfeeds showing a higher proportion of negative posts. In order to create this emotional

contagion, Facebook data scientists created an automated system that could identify the sentiment of words based on an electronic dictionary. Then, Facebook reduced the positive content in the approximately 689,000 randomly selected users' news feeds. A Forbes article discussed the results which found that "when the positive content was reduced, a larger percentage of words in people's status updates were negative and a smaller percentage were positive. When negativity was reduced, the opposite pattern occurred," (McNeal, 2014).

Technically, the emotional contagion study was legal. However, this study challenged the status quo of research ethics. Using research as manipulation and the problem of un-informed consent caused other researchers to challenge the study. According to a research article titled "Facebook's Emotional Contagion Experiment as a Challenge to Research Ethics," bloggers made posts saying that Facebook made users "sad for a psych experiment" and used people as "lab rats" (Jouhki, Lauk, Penttinen, Sormanen, & Uskali, 2016). Additionally, as most Facebook users did not read or completely understand Facebook's Data Use Policy, their consent was considered ill-informed, especially surrounding the use of their data for personal manipulation. "In general, an ethically pragmatic social media user's informed consent is more like meta-informedness, or 'implicit informed consent,' where the user knows that for example Facebook will do various known and unknown things with its user data but is unlikely to do anything that is morally too dubious," (Jouhki, Lauk, Penttinen, Sormanen, & Uskali, 2016).

Adam Kramer, the principal data scientist of the study, issued a statement at the end of June 2014 where he explained the reasoning for the study and apologized for any harm that resulted. Kramer stated "The reason we did this research is because we care about the emotional impact of Facebook and the people that use our product," (Shaw, 2015, p. 32). He went on to say "my coauthors and I are very sorry for the way the paper described the research and any anxiety

it caused. In hindsight, the research benefits of the paper may not have justified all of this anxiety,” (Shaw, 2015, p. 32). He also noted that Facebook was working to improve its internal review practices.

According to Kramer, this study harmed only 0.04% of Facebook’s users which equates to 1 in 2500 (Shaw, 2015). One could argue this may not have such a big impact in the grand scheme of things. However, many of these users were children under the age of 18 and many of the participants were presumably suffering from depression and other mental health illnesses. Consumers and scholars alike believed “steps must be taken to ensure that international psychological and medical studies involving social network users are regulated to the same standard as other human subjects research” (Shaw, 2015, p. 34). **Because an emotional contagion study had never been performed to the same extent before, the lack of legislation made this study impossible to legally resolve.**

Case 3: Amazon’s Echo and the Arkansas v. Bates Case (2017)

In November of 2017, James Bates was charged with murdering his friend Victor Collins. Two years earlier, Bates had invited a few friends over to watch a game of football and stay overnight at his home in Bentonville, Arkansas. After several hours of drinking, the friends decided to get into Bates’ hot tub. Bates claimed to have gone to bed around 1:00 a.m.; however, when he woke up the next morning, Victor Collins was found floating face down in his hot tub leading many to believe Bates had murdered his friend (Chavez, 2017, para. 15). Bates pled not guilty.

In investigating this case, police officers discovered that an Amazon Echo might have been used to play music in the Bates’ home during the night of the murder (Pfeifle, 2018, p. 422). The prosecutors requested access to the audio files, believing that the echo could provide

insight into the events that transpired leading up to the murder. Catherine Jackson and Angela Orebaugh, professors at the University of Virginia, noted in a journal article that “Even if Bates had not submitted any requests directly to Alexa, the television or anyone accidentally saying the word ‘Alexa’ could have prompted the device to record an audio file of its surroundings” (Jackson & Orebaugh, 2018, p. 94). Amazon initially refused to send any recordings or data related to Bates’ conversations with Alexa to the police, claiming that the prosecutors did not have enough compelling evidence to do so and that sending over audio files would violate the customer’s privacy rights, (Jackson & Orebaugh, 2018, p. 95). In the court documents, Amazon stated, “Given the important First Amendment and privacy implications at stake, the warrant should be quashed unless the Court finds that the State has met its heightened burden for compelled production of such materials” (Mukunyadzi, 2017, para. 6). Amazon backed its argument by claiming that the First Amendment protects people’s right to privacy and prohibits the government from accessing people’s information without a compelling need (Jackson & Orebaugh, 2018, p. 95). However, an officer’s search warrant could override first amendment rights. Bates ended up granting the prosecutors permission to the Echo voice recordings which meant Amazon had to concede the data (Jackson & Orebaugh, 2018, p. 95).

This case sparked a conversation surrounding privacy concerns with voice-activated assistants for the future. Robert Graham, a security consultant at Errata Security, noted “It’s likely that laws will be passed that will allow the police to remotely activate these devices and eavesdrop on suspects,” (Cranz, 2016, para. 14). Voice-activated assistants have recently become widely used and accepted forms of technology; however, the associated privacy concerns still exist for many users. **Because the United States lacked a legal precedent for handling the use of voice-activated assistants as evidence in criminal cases, the decision to either sacrifice**

consumer privacy in order to achieve justice or uphold privacy at all costs became even more difficult to make.

Conceptual Framework Discussion

The Social Construction of Technology (SCOT) framework, developed by Trevor Pinch and Wiebe Bijker, explains how various stakeholder groups influence a technology's design and utilization features. Each group of stakeholders has its own ideas as to how the technology should solve a particular problem. As a result, competing viewpoints shape the stabilization of the technology. Stabilization refers to the final form of the technology whereby one social group's ideas prevail over the others or two or more groups negotiate a compromise. SCOT argues that "technological innovation is a complex process of co-construction in which technology and society, to the degree that they could even be conceived separately of one another, negotiate the meaning of new technological artifacts, alter technology through resistance, and construct social and technological frames-of-thought, practices and action" ("Social Construction of Technology", n.d.).

One can use the Social Construction of Technology to frame the ethics cases described previously. All three of the cases demonstrate stakeholder groups with various perspectives about how each respective case should be resolved. The figures that follow show these stakeholder groups as well as their underlying motivations.

Case 1 Analysis

When looking at the Beacon case, the needs of the stakeholders shaped the way Facebook and other companies would handle issues related to privacy and online advertising in the future. Facebook depends on its users for success. If Facebook began losing users due to a lack of trust

in the company to protect their privacy online, the whole Facebook platform would crumble and the purpose of advertising would become irrelevant.

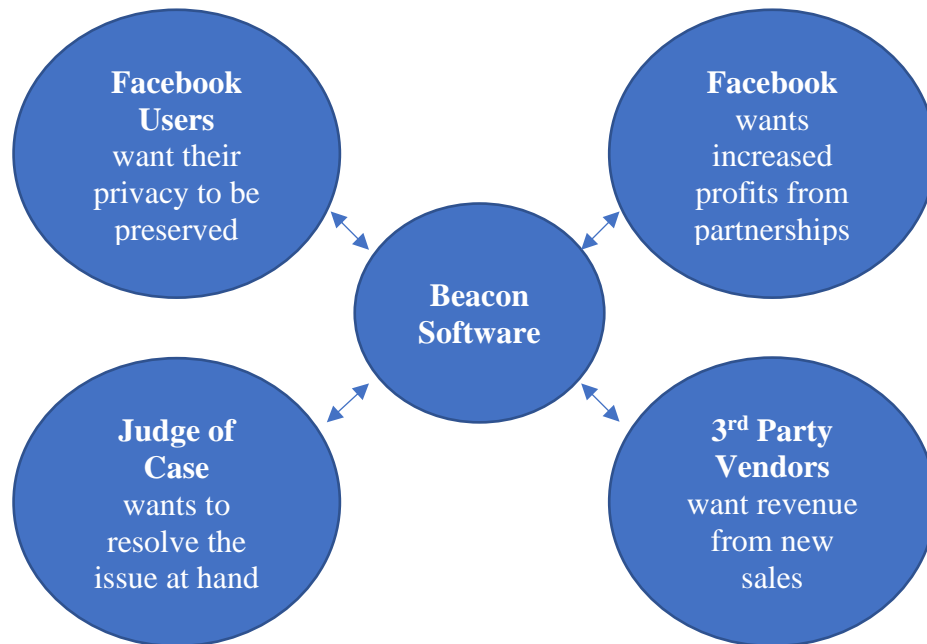


Figure 1: SCOT Model for Beacon Case: The figure depicts the Beacon software at the center of the model with the stakeholders around the perimeter and arrows demonstrating the interactions. (Adapted by Kayla Spigelman from B. Carlson, 2020).

In this SCOT model, the Facebook users' motivation ultimately determined the fate of the Beacon software. Being the user group most prioritized by legislators who reviewed the case, the Facebook users' settlement was approved and Facebook terminated the Beacon software. Facebook users affected by Beacon argued that the Beacon software violated their right to privacy. The proposed settlement included the termination of the Beacon program, a payment of notice and administrative costs, a settlement fund of \$9.5 million and the formation a Privacy Foundation to promote online privacy and safety on behalf of Facebook (Lane v. Facebook, 2013).

Case 2 Analysis

In Facebook’s Emotional Contagion Study, controversy stemmed from manipulating human emotion without informed consent. The authors of the Data Use Policy claimed that their research methods were consistent with the language of the policy. However, none of the participants knew they were taking part in the study which implies consent was not given. Most likely, if the participants had known their emotional well-being would be manipulated, not all of the 689,000 users would have consented to the study. Additionally, Facebook’s policy did state they may use personal information “for internal operations, including troubleshooting, data analysis, testing, research and service improvement,” (Shaw, 2015, p. 30). However, the policy did not say anything about using personal data for psychological experiments.

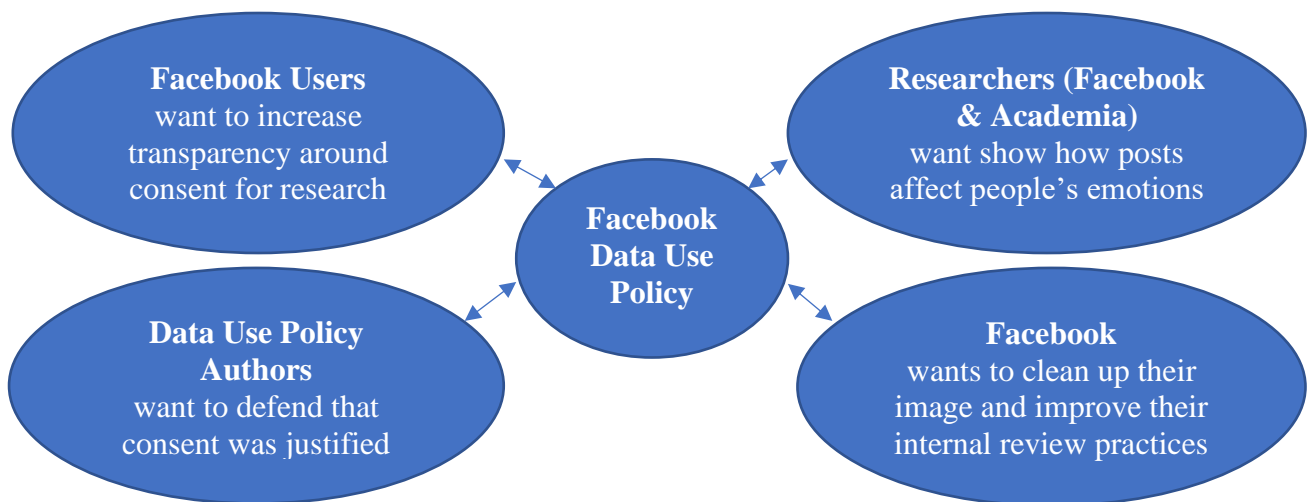


Figure 2: SCOT Model for Emotional Contagion Study: The figure depicts Facebook’s Data Use Policy at the center of the model with the stakeholders around the perimeter and arrows demonstrating interactions. (Adapted by Kayla Spigelman from B. Carlson, 2020).

The stakeholders in the SCOT model above each serve a different purpose. Three out of the four stakeholder groups shown represent the interests of Facebook. However, the prioritization of stakeholder groups does not fall equally. If Facebook wanted to remain a major

player in the technology world, the company would ultimately be responsible for altering the Data Use Policy to protect the emotional wellbeing of its users. This signifies that the influence of the Facebook users as a stakeholder group holds the most weight. To resolve the situation, Facebook did in fact take responsibility for their unethical behavior and stated they would revise their internal review practices.

Case 3 Analysis

In the Arkansas v. Bates Case, Amazon battled the prosecutors of the case to protect and preserve the privacy of James Bates, one of its customers, by refusing to turn over the audio recordings on Bates's Echo from the night of the murder. The SCOT model shown in Figure 3 demonstrates the motivations of each of the parties involved in the Arkansas v. Bates case. In an effort to preserve its own image, Amazon made a statement claiming that the company prioritized protecting customer privacy. Echo recordings had not been used much, if at all, in criminal cases before Arkansas v. Bates so the decisions being made would be critical in establishing a future precedent.

Bates ended up granting permission for the audio files to be used which later sparked controversy among other customers. Other Echo owners began to question how much Amazon's Alexa "listens" to their conversations and how safe their personal conversations really are. It seemed as though Arkansas v. Bates would set the precedent that conversations can and will be held against customers of voice-activated assistants during court cases or any number of other applications. People began to question how much surveillance companies like Amazon conduct and what the future of regulations in this field might look like.

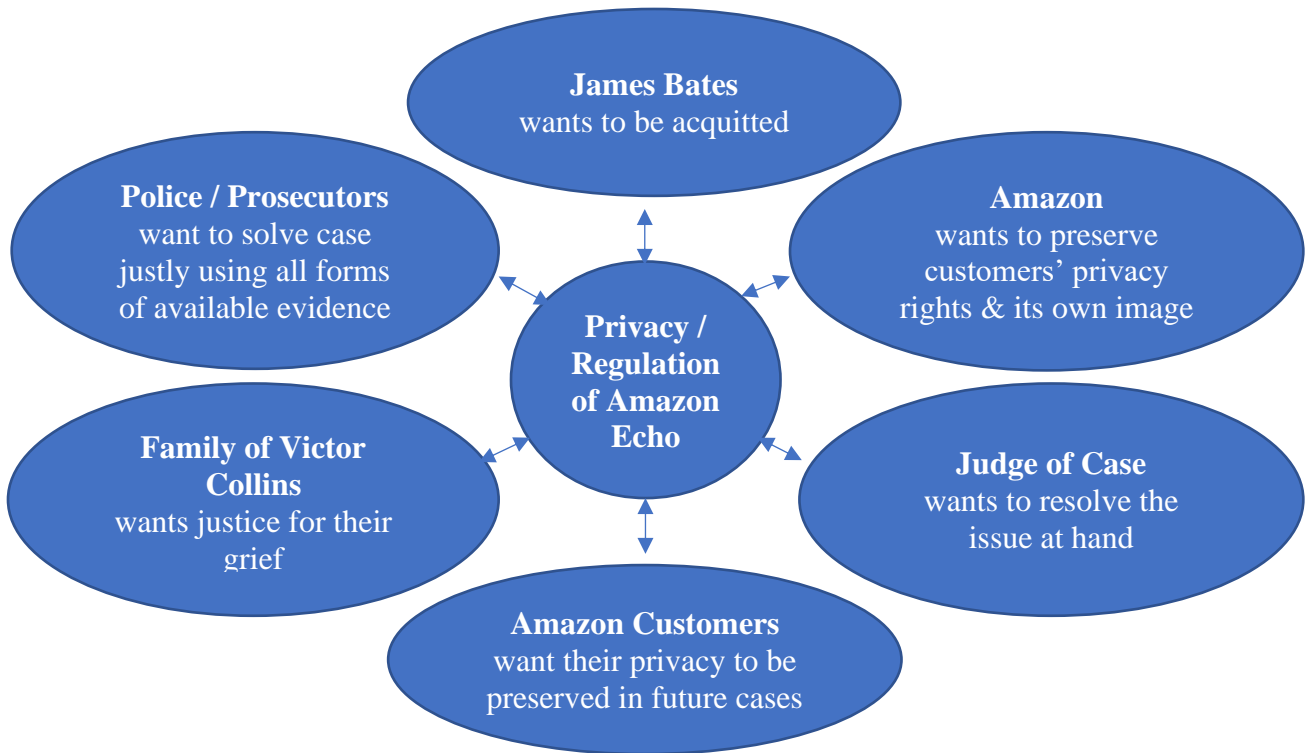


Figure 3: SCOT Model for Arkansas v. Bates Case: The figure depicts the concept of privacy and regulation for Amazon's Echo at the center of the model with the stakeholders around the perimeter and arrows demonstrating the interactions. (Adapted by Kayla Spigelman from B. Carlson, 2020).

Is There a Solution to the Pacing Problem?

In conjunction, the analysis of the three cases presented in this paper proves that a common one-size-fits-all solution simply does not exist. The Social Construction of Technology framework validates that each stakeholder groups' interests shape the future of the technology being evaluated as well as other related technological innovations. The motivations of each stakeholder differ, causing a multi-way tug of war battle over whose resolution should become the new truth. In order to resolve solve complex scenarios pertaining to technology at a pace that parallels innovation, legislation must be adaptable and institutions must be reformed.

Given the pace of technological growth, regulating technologies effectively requires an understanding of the technology's potential in the future as well as the problems it may present. Legislation must be flexible, creating a need for adaptive government. Marchant commented on this idea of adaptive government writing, "Accordingly, it is critical to implement processes that permit frequent and ongoing reevaluation and revisions of regulatory programs to address changing facts and circumstances" (Marchant, Allenby, & Herkert, 2011). Adaptive government requires iterations to detect and respond to relevant changes as quickly as they appear in order to prevent wide-scale complications in the future. One mechanism to implement adaptive government would include a framework convention to govern emerging technologies (Marchant, Allenby, & Herkert, 2011). A framework convention would include an institutional organizing body, a process for parties to meet regularly, as well as some core principles (Marchant, Allenby, & Herkert, 2011). The framework convention does not contain solutions to technological problems but rather creates the underpinning for building adaptive governance protocols based on the ever-changing needs of society members.

Institutional reform can also lessen the effect of the pacing problem. This includes making government agencies, private companies and individual stakeholders more capable of detecting issues before they arise. David Rejeski (2011) noted some examples of institutional reform in his chapter of *The Growing Gap Between Emerging Technologies and Legal-Ethical Oversight: The Pacing Problem* which could include “creating a safety reporting system for reporting and studying errors or embedding an ‘early warning officer’ and support staff within agencies to scan the horizon for approaching issues and challenges” (Marchant, Allenby, & Herkert, 2011). Together, adaptive government and institutional reform will help pave the way for legislative reform.

Conclusion

Without a doubt, technological innovation has stimulated political, social and economic growth, creating opportunities for people across the world to have state-of-the-art jobs, start their own companies, connect with one another and discover something new. However, the pace at which technologies have emerged has caused legislation to lag behind the necessary benchmark that ensures ethical decision-making. The cases presented in this paper prove that a lack of legal precedent makes it difficult to resolve complex scenarios involving new technological systems. The line between right and wrong can be blurred when tackling novel issues. A high degree of technological fluency is needed on behalf of the government, company stakeholders and individuals so that together, we can solve the pacing problem.

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