



Consumers' Research

established 1929

Bulletin • Winter 2014

Game Theory: A DAO Thought Experiment

Angus Champion de Crespigny

Borrowing Time: New Revenue Strategies for Utilities

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The Results are In: Soylent, Food of the Future?

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2014 Job Market Recap

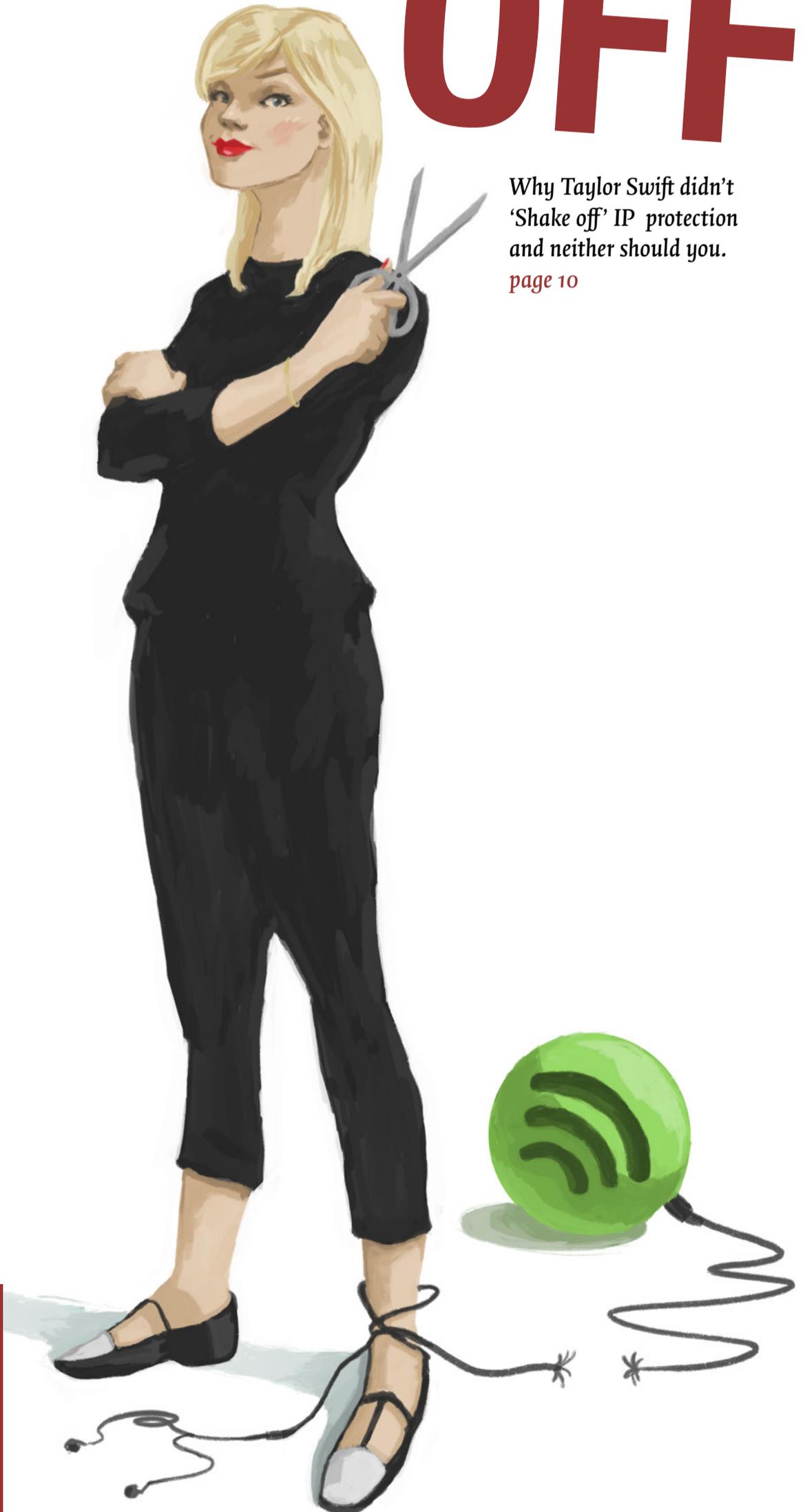
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SHAKEN OFF

Why Taylor Swift didn't 'Shake off' IP protection and neither should you.
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Consumers' Research is an independent educational organization whose mission is to increase the knowledge and understanding of issues, policies, products, and services of concern to consumers and to promote the freedom to act on that knowledge and understanding.

Consumers' Research believes that the cost, quality, availability, and variety of goods and services used or desired by American consumers—from both the private and public sectors—are improved by greater consumer knowledge and freedom.

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Letter *from the* Executive Director

Joseph Colangelo

With both sides of the aisle focusing on bettering the middle class this new legislative session, Congress should consider determining how to better protect the intellectual property of innovative Americans. America's knowledge-based economy requires international treaties and enforcement of current laws to keep American IP safe and to encourage innovation.

IP protection is synonymous with more U.S. jobs and entrepreneurship. The most recent report from the U.S. Department of Commerce and the U.S. Patent and Trademark Office found that, in 2010, direct employment in the most IP-intensive industries in the U.S. accounted for 27.1 million jobs, and indirect activities associated with those industries provided an additional 12.9 million jobs for a total of 40 million. Jobs related to IP industries comprise a staggering 27.7 percent of all jobs in the U.S. economy. That's why Congress must act to preserve America's ability to remain a world leader in innovation.

One of the hurdles that Congress must overcome is drafting legislation that protects IP while not restricting the freedom of the Internet. Congress has not been able to pass IP legislation because it tried to apply U.S. brick-and-mortar IP laws in this arena. New IP-protection legislation must assure Internet users that their freedoms will be protected while at the same time preserving our economy with strict IP protection.

Internet users must take some responsibility, too, to ensure that their freedoms aren't infringed upon by employing self-policing. Members of the community need to be continually informed about the consequences of Internet piracy and U.S. laws must be enforced. Pirating a movie is just as illegal as slipping a DVD into your pocket and stealing it from a retail store. A truly free Internet, like any truly free community, is one where people can engage in legitimate activities safely and where bad actors are held accountable.

American industry is leading the way with new innovative strategies to protect IP. Recently Apple filed a patent for new technology that would allow buyers of content obtained legally to share it, according to a Bloomberg Business report.

Apple believes that allowing legitimate buyers to share their content would cut down on the number of people downloading content illegally.

The focus of IP protection must involve tough trade penalties on countries that refuse to crack down on Internet piracy. Too many foreign governments look the other way when it comes to IP theft. The lure of access to the U.S. market should be used as an incentive to convince trading partners that they should increase their protection of IP rights. Strong IP protections are integral to all trade agreement negotiations to protect software developers, artists, and industry. Not only is this sound business practice, protecting IP is a Constitutional right.

The founding fathers recognized the importance of IP in Article I, Section 8 of the Constitution: "To promote the Progress of Science and useful Arts, by securing for limited times to Authors and Inventors the exclusive Right to their respective Writings and Discoveries."

This clause, articulated by the founders, is rooted in the notion that the best way to encourage creation and dissemination of new inventions and creative works to the benefit of both the public good and individual liberty is to recognize one's right to his or her intellectual property.

Consumers' Research asks Congress to encourage U.S. ingenuity to protect IP on the Internet and to draft Legislation that will give our trade partners incentive to crack down on illegal downloads. Protecting American IP will continue to make our country the world's leading innovator. ◀



Blasting the Past, Preserving the Present

In early issues of our magazine, we published a section called The Consumers' Observation Post, which featured brief insights, speculations, and helpful tidbits on consumer goods, services, trends, and tools. Here we reexamine some of those snippets, occasionally revise some of our charming but outmoded assertions, and make some new comments on current consumer affairs.

Slow & Steady Still Wins the Race

It's no secret that overweight and obesity rates in the U.S. have steadily increased over the years. In the 1970s, the U.S. Department of Health and Human Services reported that approximately 23 percent of Americans were obese, compared to the 35 percent reported in 2010. Yet, not unlike today, 30 years ago extra pounds were attributed to an overly sedentary lifestyle and fad diets and regimes were looked to as a popular way to slim down. An article published by CR in 1970 advised adults to avoid fad diets (such as the buttermilk diet) and instead embrace a moderate limitation of food over three meals per day as well as a moderate exercise regime. Sound familiar? Even more familiar is the recommendation for individuals to join Weight Watchers, a new commercial venture allowing like-minded people to join forces and motivate one another. Upon reviewing the 1970 Weight Watchers program, CR expressed skepticism at the success of such a regimen, pointing out that it encouraged the unhindered use of high sodium products (such as bouillon, cooking salt, and soy sauce) as well as water. Weight Watchers has since evolved its program to include a wider range of regimens and meal plans, accounting for more health and dietary constraints (such as diabetes and veganism) and gathering many success stories along the way.

Bring Out the Bubbly

In 1970, CR published a brief history of champagne, which was becoming increasingly popular among American consumers at the time. Up to that point, champagne had been associated with a certain elegance and wealth, due to the geographic exclusivity of the product. Since then, champagne, no longer relegated to wedding and New Year's Eve

toasts, has become even more popular. The Wall Street Journal reports champagne sales have greatly increased since 2009, but face a new competitor in the market – prosecco. The trendy Italian sparkling wine saw sales rise 32 percent in a 12-month period ending in December. Revered for its sweet taste and affordability, the sparkling wine costs around \$12 per bottle – a steal compared to \$50 for a genuine bottle of Champagne. Champagne Bureau Director (yes, that's a thing) Sam Heitner is not worried though. Heitner says, "The more people drink sparkling wine, the stronger the opportunity for Champagne to take people thinking about sparkling wine and move them into the Champagne category."

Portable Phonographs

CR tested the portable phonograph, the cutting edge of music technology in 1970, and came away impressed with the high quality sound it produced as well as how compact and easy to use it was. This phonograph was one of the early portable music devices and was celebrated for only weighing 27 to 32 pounds. Imagine taking that out for a jog! Inventors were clearly aware of the desire for a soundtrack to daily life, as portable music has come a long way since then. Today, MP3 players, such as the iPod shuffle, are so small and lightweight they are easy to forget (and may even be accidentally left in a pocket and thrown into the washing machine). ◀

If you Can't Beat 'Em... Profit from 'Em?

Internet Privacy: Safeguarding Personal Data vs. Capitalizing on the Inevitable

Kyle Burgess

It's no surprise that younger generations have a better grasp of technology and the Internet than their predecessors who remember when typewriters were "unplugged" or when "dial-up" was considered cutting edge. However, even Millennials' level of knowledge on these topics is markedly lower than what might be expected, and overall consumer knowledge of Internet and data privacy is even worse than general knowledge of technology and the Internet. This lack of understanding is just one of a multitude of reasons why internet privacy is perceived as menacing.

To protect their privacy, consumers should have a better understanding of what information they are sharing over the web, what information is being generated about them via the websites, products, and services they engage with, and how their personal information is being used and by whom. That said, even being armed with knowledge won't stop the inevitable. If consumers insist on using certain Internet-based services, there is no way to avoid giving up personal information. User agreements often require more invasion than consumers would knowingly be comfortable giving up; however, ignorance, laziness, and desire to use certain products and services at whatever cost drive consumers to give into terms they probably wouldn't accept otherwise.

Of course, some consumers are starting to capitalize on their personal data. Having grown up in the Internet Age, younger generations seem to be less concerned with what information is publically available about them and how advertising agencies or corporations are using their information to market goods and services to them. Some have gone so far as to sell this data, profiting from, well, the inevitable.

What Do Consumers Know About Technology and the Internet?

A September 2014 survey conducted by Pew Research Center called "What Internet Users Know about Technology and the Web" polled 1,066 American Internet users on questions regarding the Internet and related technologies. Some of the questions covered things like where hashtags are used, who

Bill Gates is (by sight), what Moore's Law means, and what Internet privacy policy means. The survey found that the majority of study participants had a limited understanding of Net Neutrality and privacy. Sixty-one percent correctly identified Net Neutrality – a fairly complex issue – whereas only 44 percent of participants responded correctly to the question regarding company privacy policies.

Aaron Smith, senior researcher for Pew's Internet Project, says:

"In terms of privacy policy awareness, we found it notable how much knowledge on this issue has not changed over the years... Despite all of the data breaches, news stories, and policy discussions that have been happening around this issue over the last decade, Americans are not substantially more informed about this subject than they were a decade ago."

Demographically, younger Internet users performed best on the quiz, with ages 18 to 29 answering 60 percent of the questions correctly. Participants ages 65 and older answered 45 percent of the questions correctly. Young Internet users were revealed to be more knowledgeable, especially in regards to questions involving social media and common Internet conventions.

Industry analysts claim the survey emphasizes a growing problem in the U.S. – a generation that is reliant on technology but has little understanding of the potential risks of online transactions. Smith notes, "Just because people use these gadgets a lot doesn't necessarily mean they know everything about how they work and where they came from."

What Choice Do Consumers Have?

According to estimates by Aleecia M. McDonald and Lorrie Faith Cranor, as published in *I/S: A Journal of Law and Policy for the Information Society*, it would take the average consumer roughly 244 hours per year to read each new Internet privacy policy they encountered word-for-word. That's roughly 40

minutes per day or 10.16 weeks. With only 52 weeks in a year, it's no surprise that most consumers gloss over terms of use agreements, often accepting the terms without even skimming key sections on privacy and data use. Of course, knowing the terms of service doesn't change what companies require of consumers in order to use their products and services. It seems that for many consumers, the desire to use certain products and services outweighs their desire to keep their personal information private.

In the fall, Facebook released a new messenger application, which became the only way mobile app users of the social media site could send and receive messages to their Facebook network. This was initially a cause of concern for many of its users. Most of the criticism was based on what were perceived as "Big Brother" policies, such as the ability of the application to call phone numbers in the user's contacts and use the phone's camera or microphone without giving notification. These permissions are necessary to enable users to seamlessly send and receive calls and photos through the app, however, they seem unsettling out of context. Although this type of "scary language" can result in consumer resistance to certain products, many still shrug the notion of being mined for data, especially if they are compensated financially.

Why Give the "Milk" for Free if Companies Will Buy It?

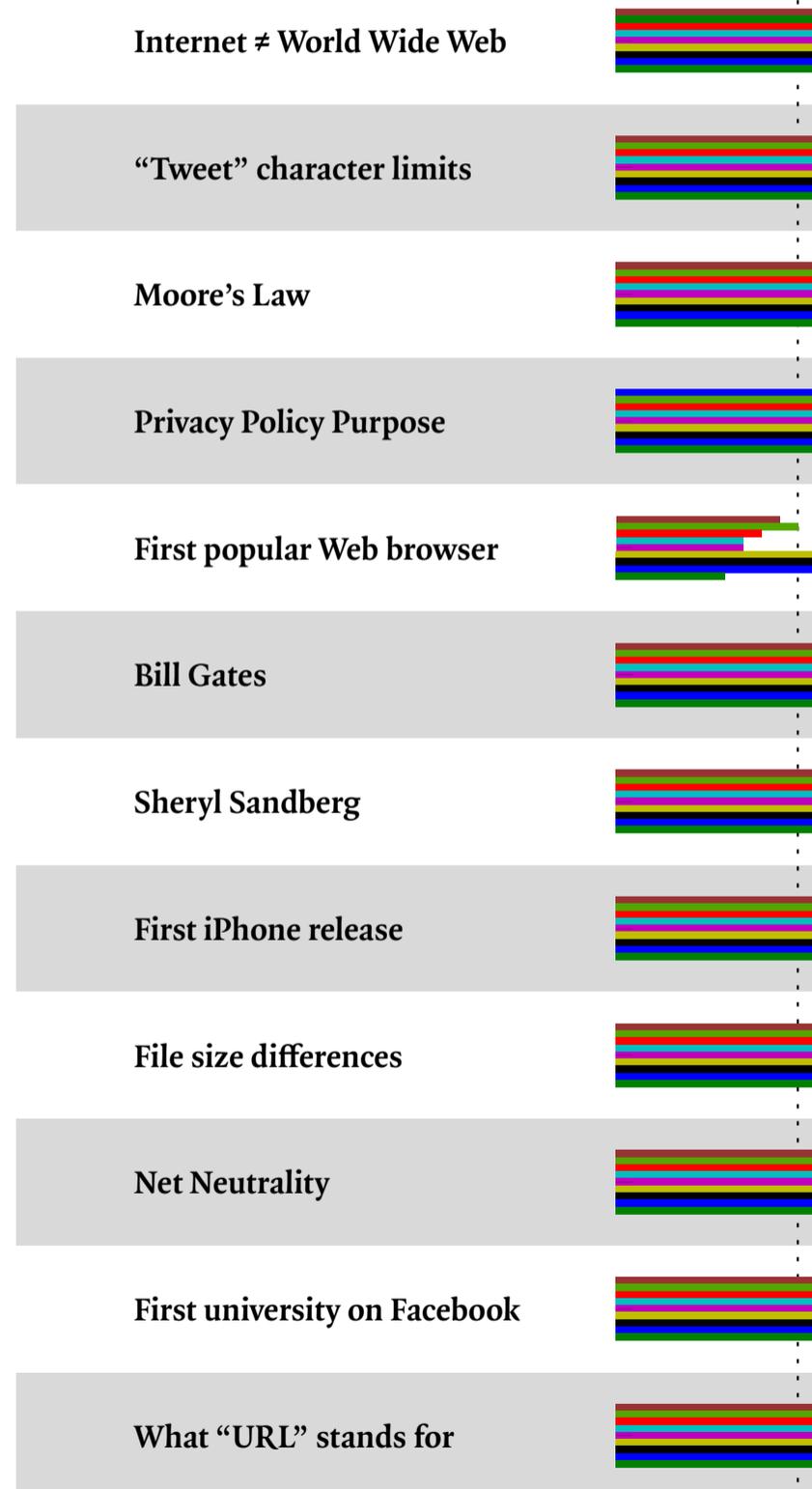
Many Internet users employ software to protect themselves from unexpected data collection, placing programs such as AVG PrivacyFix, Evidon's Ghostery, and Mozilla's Lightbeam in demand. It seems that public sentiments are split on the issue of technological privacy. While the Pew Center reports that about half of Americans are concerned about personal data on the web, PunchTab, an advertising company, found that 27 percent of participants in a survey of 1,100 people would be willing to allow the tracking of their online movements in exchange for compensation. The future of technological privacy may therefore be up for grabs.

For those Internet users willing to sign up for the "privilege" of being watched, San Diego based start-up Luth Research is already working on advancements to its data collecting techniques. Luth has developed programs that pay to track users' online movements in order to provide corporate clients with much sought after information.

Luth's "ZQ Intelligence" program collects users' data through a virtual private network and analyzes the data for trends. The program is available on personal computers and mobile devices where

Google search engine queries and webpage visits are tracked and studied in conjunction with information provided by users. The data provided to Luth can be integral to companies wishing to gain a better understanding of consumers' habits and desires. Luth Research has worked for companies like Subway, Ford Motor Company, and Netflix to provide information about potential and actual customers. The information collected by this software can help companies determine where to spend their advertising dollars in order to more effectively target consumers.

In a truly Orwellian fashion, Luth says it is working on a program that aims to collect the audio users' environments in order to determine what they're doing,

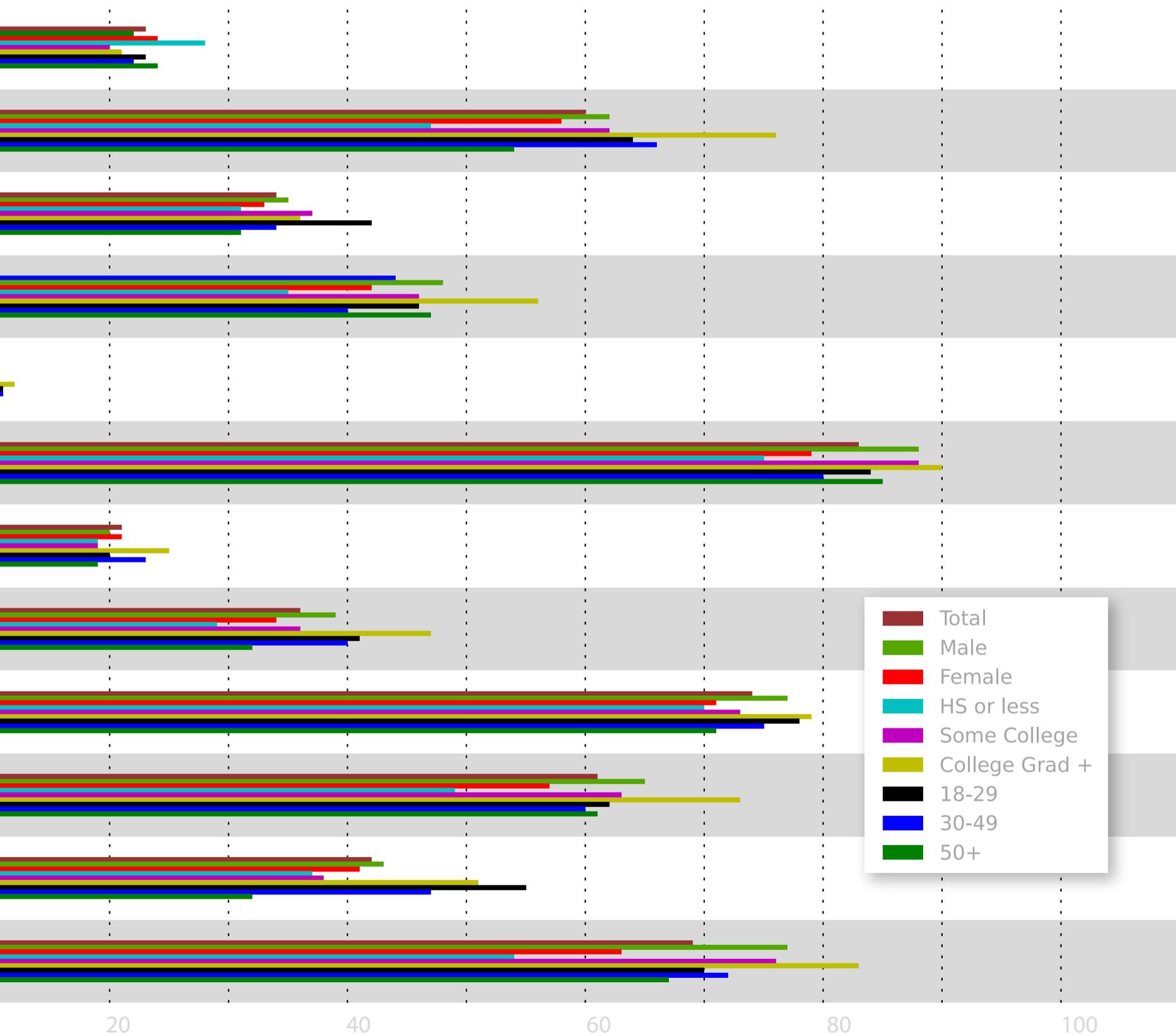


Source: Pew Research Center, Pew Research Internet Project - What Internet Users

ultimately for incorporation with the rest of the data being collected on them. As creepy as it sounds, Luth wouldn't be developing the program if there weren't consumers willing to sign up for it.

Protection Precautions

For those who value privacy protection over some quick cash, the next issue of CR will provide useful tips on safeguarding personal information on the Internet. Although, the best (but absurdly impractical) way to truly safeguard against Internet privacy issues is simply not to use Internet products and services that require giving up this information. ◀



Know about Technology and the Web

Game Theory *and* Collaboration

A thought experiment with Decentralized Autonomous Organizations

Angus Champion de Crespigny

The Prisoners' Dilemma

Game theory is the study of strategy using mathematical or logical models of conflict and cooperation between rational decision-makers aiming to achieve optimal outcomes, and it is an interesting area of study when used to understand the collective results of individual actions around the globe. One thing game theory tells us is that, in the absence of intervention, the natural equilibrium of a number of world issues – deforestation, overfishing, pollution – leads to a race to the bottom.

What if blockchain technologies could assist in resolving these issues without the need for intervention?

To understand the causes of the race to the bottom and how these issues may be resolved, a brief overview of game theory may be beneficial. One of the most famous examples of game theory in action is the prisoners' dilemma. In this model, two prisoners, isolated for interrogation in separate rooms and unable to communicate, are told to confess to a major crime committed jointly. In prisoners' dilemma actual guilt or innocence is irrelevant.

As demonstrated in the table below, if both parties remain silent, they are imprisoned for one year for a known lesser crime. If one confesses to the major crime and betrays the other party who remains silent, the incriminated prisoner is sentenced to 10 years while the confessor is set free as a reward for assisting in solving the major crime. If both confess, they are each sentenced to five years. While the best result for the pair is for both parties to maintain innocence, each prisoner in isolation is better served individually by confessing and betraying the other party.

The Prisoners' Dilemma

		Prisoner A	
		Confess/Betray	Remain Silent
Prisoner B	Confess/Betray	5 yrs / 5 yrs	10 yrs / Set free
	Remain Silent	Set free / 10 yrs	1 yr / 1 yr

Consequently, the natural equilibrium is for each to confess and betray, leading to a negative outcome for both.

The Race to the Bottom

When such a situation is repeated many times over, in some cases this can lead to rather detrimental end states, often referred to as the race to the bottom. While it would be beneficial in the long term for all countries to cooperate and limit pollution, in the short term some countries may not cooperate and pollute regardless. In this case, non-polluters would consequently get the worst of both worlds – increased pollution and economic disadvantage. By polluting, countries may gain economic growth, even if the environment is damaged as a result, but in the long term producing a worse overall result than if they had cooperated.

To solve this race to the bottom, the parties involved need to accept that the long-term benefits of collaboration are superior to the short-term benefits of cheating, and act accordingly.

Currently, actors attempt to achieve optimal outcomes through supervisory committees, organizations, or cartels, where future benefits are improved through collaboration and cheating parties are punished. These organizations, however, may be ineffective or non-existent for numerous reasons, including: corruption, insufficient incentives, short-sighted objectives, lack of trust, etc. Could an intervening body be more effective or more likely to succeed as a Decentralized Autonomous Organization (DAO)?

Such an organization could automatically apply fair benefits according to a predefined set of rules, ensuring collaboration and the optimal outcome for the group. For this to work, however, two questions need to be solved, namely:

- *Proof of X* – how to prove beyond doubt that the activity being monitored is an accurate representation of what has been performed, and
- *Assurance of participation* – how to guarantee that a number of sufficient parties participate to ensure that no one cheats by simply not taking part.

The following section demonstrates these issues through a real-world example.

Overfishing

There is little doubt that overfishing is a chronic issue. In many parts of the world, more fish are taken from the ocean each year than can be replenished in the same time period, leading to consistently dwindling fish stocks. Despite this, a trawler that

¹ A Decentralized Autonomous Organization, or DAO, is a concept which leverages the distributed trust capabilities of digital asset protocols. A DAO would be made up of various pieces of code or small programs stored on the blockchain, which would be executed by the network of computers running the protocol. Coded correctly, such a collection of programs could run as an independent organization with no central authority controlling the code, but instead with the code stored in a distributed manner across the network.

takes in fewer fish to allow for a larger population to remain, consequently allowing the population to last further into the future, also risks potential profits, as its competitor will take the fish that are left behind in addition to their own catch.

With no punishment for cheating and little way of getting caught, trawlers could continue to take each other's catch, even if it means future profits are hit – much better to have a business survive for another year than not survive beyond the next week. If, however, “proof of catch” could be established, a DAO could be launched to oversee catches and distribute fair profits, while ensuring no participants cheat.

A “proof of catch” algorithm would need to be executed in such a way that it could not be manipulated, which is a known problem with incorporating data into a blockchain from an external source. Such an algorithm may take multiple factors and cross-compare them to identify cases of cheating the algorithm, including: ship displacement, weight of fish unloaded, time spent at sea, etc. The algorithm, however, would also need to be easy and cost effective to implement in order for actors to benefit from organizing through a DAO.

Additionally, the DAO will not be successful if it cannot provide sufficient assurance of participation. That is, if participants are punished for cheating, whereas non-participant trawlers are free to overfish, there may be little incentive to participate and consequently little benefit in forming the DAO to begin with. If, however, the DAO can provide sufficient incentive to participate, assurance of participation can be met and consequently the DAO's full benefit can be realized, averting the economic race to the bottom and the need for a central authority.

Such incentive may come in a number of forms. In this case, the most basic would be a certification demonstrating a commitment to sustainability through membership of the organization, in the same way Fair Trade, Free Range, or Organic labeling functions. This type of certification results in value-added products that fetch premium prices, therefore incentivizing actors to participate. Another incentive may be supply chains which are fully integrated into the blockchain – if profits are distributed on the blockchain, complete end-to-end integration may be more efficient and cheaper to maintain if linked into the blockchain through the DAO from the start.

A blockchain integrated DAO would have a number of advantages. Firstly, it could significantly reduce administrative costs by automating much of the bureaucracy involved in intervention. Secondly, by publishing all activities on the blockchain, it could reduce the potential for corruption by making all

activity visible to independent parties. Thirdly, as all activity would pass through a predefined set of logical rules that are immediately enforced and cannot be altered without a voting process, such infrastructure may reduce or remove the potential for cheating or rule bending by individual participants.

Realities of a DAO Migration

Assuming everything could be moved seamlessly to a DAO, there are still a number of outstanding considerations in moving any bureaucracy to such a structure.

Firstly, no DAO will be perfectly sustainably built from the start. Thus, the concept of voting for changes to the DAO has been established. Such DAOs have been upheld as the ultimate in fairness – a true democracy, free of the corruption of people in the current political environment. The question, however, is how would voting in a DAO truly differ from voting in the physical world? If a DAO is sufficiently critically important, financially powerful parties could buy votes through purchasing a larger voting stake or by lobbying individual voters, in much the same way that lobbying currently occurs. While the theory is that any users unhappy with such a situation would change DAOs, in reality this does not always happen. Despite all the recent uproar with the banks' handling of the global financial crisis and the Occupy Wall Street movement, consumers continue to open accounts and purchase products at the largest, most powerful financial institutions which many blame for the crisis. There does not appear to be a reason why such a situation would change by simply changing the platform on which voting occurs.

While a DAO may prove to be an ideal way of resolving such damaging race to the bottom situations, ultimately, such a solution may suffer at the very first step – getting off the ground. That is, how might such a DAO organically evolve, without the need for a central body mandating its creation? Blockchain technologies have plenty of potential to encourage collaboration through demonstrably fair, decentralized contracts; however, such solutions will need to be created in a way that allows an organic transition from the status quo. ◀

Wearable Tech: Trackables or Hackables?

Tips to Stay Informed

Anna Pleshakova

Wearable technology has rapidly evolved in the last few years. No longer limited to fitness and activity trackers, wearables now include smart watches, heart attack detecting pills, smart eyewear, interactive T-shirts, and many other devices. This technology has the potential to improve efficiency in medicine, business, relationships, security, and other everyday affairs. Gadgets can be worn around the neck, torso, head, waist, wrist, and feet. They can even be donned by pets. While wearables carry great potential, many remain concerned over the security issues associated with the highly personal devices.

Capabilities

Data collection is the name of the game. Across all types of wearable technology platforms, the ability to track, record, and evaluate data, ranging from stats on physical activity to energy usage, allows consumers to gain a better understanding of themselves, while also enabling companies to gain a better understanding of consumers. Heightened convenience, lower costs, improved services, and greater access to information are among the anticipated benefits of wearable technology. The *Wearable Future*, a report published by PricewaterhouseCoopers (PwC), claims the three potential benefits Millennial users and early adopters are most looking forward to include improved safety, healthier living, and simplicity and ease of use. The health care industry is expected to be especially affected by wearable innovations, allowing patients to track their own vitals, as well as supply doctors with the information collected. Not only might the vast collection of information improve public health systems, but insurance companies are considering making widespread use of activity trackers a way of determining user premiums.

Wearables Data is Often Open to the Public

Compared to other data collectors (such as mobile apps, smart phones, and online financial systems), the unease about data collection stemming from wearables is relatively low. However, more user control (and awareness) over what data is collected and made public is perhaps needed. For example, FitBit, the activity tracker, gave users the option to

manually record sexual activity as a form of exercise (ranging from “passive, light effort” to “active, vigorous effort”) as well as the amount of time spent per session. By default, this tracker displays all exercise information publicly online to encourage social interaction and competitiveness – something many users were unaware of. Several devices, including smart watches and certain fitness trackers, also record personal information such as current location and residential details. This, experts say, creates an opportunity for unsavory characters to learn when a user’s home is most vulnerable to criminal activity. Furthermore, users are often surprised to find they are not the only party that legally “owns” or has access to their personal data – it also belongs to the company that manufactured the device and any partners they may have agreements with.

Hacking

Another area of concern is that wearables may become popular targets for hackers. According to the 2014 IT Risk/Reward Barometer published by the Information Systems Audit and Control Association (ISACA), the growth of wearable technology and the Internet of Things demands an “educate and embrace” approach. In light of the highly publicized data breaches at companies including Target, eBay, and JPMorgan Chase, 94 percent of American respondents claimed they had heard of the attacks and 75 percent said the reports had heightened their privacy concerns. However, less than half of those same respondents reported changing their pin codes or passwords and only 25 percent said they had chosen to shop less often at the affected retailers. The report suggests there is a large gap between what consumers understand about privacy and how they apply it to their own lives. Many want to know if privacy is decreasing.

When Google Glass was first introduced consumers wondered whether potential hackers could see and hear everything users were doing through the device. Of course, Google has taken precautions against the most obvious risks but, as with many things, problems are often unknown until they are faced head-on. It is important for consumers to be mindful of how much information they are putting out in public in order to limit potential dangers.

Spam

Spam also has the potential to take advantage of vulnerable devices and in turn become a safety issue for users. Dummy accounts are created to spam landing pages, opening users up to harmful malware. A survey conducted by computer security company ProofPoint shows that 25 percent of compromised “computers” are smart devices. Smart devices used in the home include webcams, refrigerators, entertainment systems, and heating and cooling systems. All of these devices, including wearables, are susceptible to interference from hackers obtaining remote access through the Internet, which can become a significant safety concern. For example, Dr. Ross Anderson, computer security researcher at Cambridge University enquires, “What happens if someone writes some malware that takes over air conditioners, and then turns them on and off remotely?” Harmless fun, right? Wrong. “You could bring down a power grid if you wanted to,” continues Anderson.

Falsifying Data

Companies may also run into a “loss of integrity” due to the injection of false data by users, which allows them to gain rewards while taking away those prospects from others who are earning them honestly. For example, when given the opportunity to trim health insurance costs users may be tempted to falsify their information. Without the appropriate measures in place, bad actors may attempt to attach their fitness trackers to pets or even pay others to sport them in order to improve their physical activity stats.

Prevention Methods

What can users do to prevent hackers from tampering with their devices? Below are some of the most common recommendations:

- Disable Bluetooth and Wi-Fi when not needed
- Only use Wi-Fi/hotspots of known networks
- Lock the device’s screen when not in use
- Keep devices/software updated
- Enable device/data encryption
- Install security software
- Use strong passwords
- Vary usernames and passwords
- Read and understand device privacy policies and user agreements (or terms of service)

It is important for consumers to stay alert and keep in mind the possible threats that wearable technology can bring. “Unfortunately we often see the lack of security when new classes of devices are introduced,” says Candid Wueest, co-author of *How Safe is Your Quantified Self?* “The quantified self devices are still considered safe to use in general,” Wueest added. “We

recommend that users familiarize themselves with the potential risks and take precautions to help protect themselves.”

The Future

The wearable technology sector expects an even larger amount of new entrants. There are many start-up companies that have received funds from crowdfunding campaigns and are creating new, innovative devices. PwC’s *The Wearable Future* report notes that the wearable technology industry is “ripe for growth,” especially among Millennials. The report also asserts that for wearable technology to truly develop, innovators need to fully embrace the opportunities created by the Internet of Things.

As more and more people become interested in wearables, aesthetic appeal will become increasingly important. Smart devices already look futuristic but companies like Cuff, Pebble, and Martian are trying to make them more fashionable. Design and appeal were especially important in the creation of the Apple Watch, for which the company reportedly hired Burberry CEO Angela Ahrendts to contribute to the project. Furthermore, fashion brand Tory Burch has entered the wearable market with “Tory Burch for Fitbit,” promising to “transform your tracker into a super-chic accessory.” More opportunities such as this are likely to emerge as consumers demand a certain level of style from their wearable devices.

Wearables currently rely on computers or smart phones for full functionality (i.e. for user engagement platforms or dashboards), but the hope is that they eventually become autonomous. “Smart devices, until they become untethered or do something interesting on their own, will be too complicated and not really fulfill the promise of what smart devices can do,” says Mike Bell, vice president of Intel’s New Devices Group. “These devices have to be standalone and do something great on their own to get mass adoption. Then if they can do something else once you pair it, that’s fine.”

Prices are also expected to drop, making the products more accessible to consumers. Early adopters always pay a premium for new products, especially for new product categories. The high price levels will eventually come down, and the sheer amount of new players coming into the wearables market should guarantee a low-cost option.

Overall, wearable technology is a sector with high potential for growth. It is expected that several years from now, the technology will become more mainstream, with more consumers starting to use devices like FitBit and Apple Watch. However, consumers are urged to keep personal security in mind and reduce the risk of data leaks using the aforementioned prevention methods. ◀

Why Taylor didn't "Shake it Off" (and neither should you)

Olivia Ferguson

Imagine buying a Rolex watch, or if that's not your vice, maybe a Gucci handbag. You saved for months for your prize, a reward for all your hard work. You make the purchase – \$2,000, but it's worth it because you've earned it. Yet, when you get home you discover that the watch you purchased is not what you thought you were buying, but is actually a knock-off worth \$200, possibly less. You feel cheated, even robbed. This is why we have intellectual property (IP) rights. They exist to protect both consumers and creators of "works of the mind" from defrauding and infringement. Legal protections for IP attempt to safeguard buyers against information asymmetries that can result in adverse selection (such as purchasing fakes or knock-offs). IP rights also provide recourse for proprietors of creative works when their goods are illegally distributed or reproduced. From designer accessories to prescription medications, the legal framework surrounding IP aims to ensure consumers get the brand and associated quality they expect from the products they purchase, while simultaneously promoting competition and innovation among producers who seek to gain the full financial and social benefits of their creations.

In November, the Global Intellectual Property Center hosted the 2014 Global IP Summit at the U.S. Chamber of Commerce in Washington, D.C. The event brought together diverse representatives, ranging from small business owners to legislators, to discuss the importance of protecting intellectual property as well as weaknesses within the IP system. Intellectual property rights are crucial to many aspects of business and consumer protection. However, many people are familiar with the IP system due to the media's coverage of high-profile cases of IP infringement claims. Some of the most publicized recent cases include:

- *S. Victor Whitmill v. Warner Bros Entertainment Inc.* (2011) – Use of Mike Tyson tattoo in *The Hangover Part II*
- *Mattel Inc. v. MGA Entertainment Inc.* (2010) – Similarity of Barbie dolls and Bratz
- *A&M Records, Inc. v. Napster Inc.* (1999) – Music piracy

IP in the News

Conflicts within the IP system continue to maintain media relevance, as IP hot topics find their way into headlines. One such example is royalties – compensation paid to IP owners (including artists, singers, writers, inventors, songwriters, graphic designers, etc.) for the use of their protected works. The most common royalty disputes to hit the spotlight are over music. Typically, artists receive payouts if their music is played on the radio, used in a film, and distributed via online music stores, such as the iTunes Store. Furthermore, the emergence of newer services including Internet radio, such as Pandora, and more tailored music streaming services, such as Spotify, are forcing regulators to reexamine traditional royalty schemes.

Daniel Ek, founder of Spotify, claims the idea for the service came from the problems he saw within the music industry. In an interview with *The New Yorker* magazine, he said, "The problem with the music industry is piracy. Great consumer product, not a great business model. But you can't beat technology. Technology always wins. But what if you can make a better product than piracy?"

While Ek's "something is better than nothing" philosophy works for some artists, others are less willing to accept this premise. In early November, Taylor Swift not only made headlines for her latest album, but also for pulling the entire catalogue of her albums offered on Spotify. According to *The New Yorker*, the streaming service pays artists an average of .6 to .8 cents for every song streamed. Some would say that while low, it's better than what piracy offers – nothing. Swift was earning \$500,000 per month when she chose to pull her albums from Spotify. In a November *Wall Street Journal* editorial Swift explained her actions stating, "Piracy, file sharing and streaming have shrunk the numbers of paid album sales drastically, and every artist has handled this blow differently." Many responses to Swift's removal of her albums pointed out that she makes so much money it shouldn't matter that royalties from services like Spotify are low, but these complaints haven't seemed to hurt Swift's popularity or sales.

Similarly, within the pharmaceutical industry name-brand, patented drugs are often perceived as money grubbing. But the IP system is intended to benefit everyone. As Michelle Lee, Director of the U.S. Patent and Trademark Office (USPTO), noted at the 2014 Global IP Summit, “We are all beneficiaries of the IP system.” All in all, these cases come down to determining the value of intellectual property, the importance of protecting it, and its role in driving competition and innovation.

What is the IP system?

Intellectual property law has long been considered crucial for the continuous creation of artistic, technological, and other developments that spur the global economy and shape everyday life. The USPTO defines IP as “creations of the mind, such as inventions; literary and artistic works; designs; and symbols, names and images used in commerce.” These creations, or IP, are protected using copyrights, patents, and trademarks.

- Copyrights – rights creators have over literary and artistic works
- Patents – rights granted for an invention, giving the owner the right to decide how the invention can be used by others
- Trademark – a sign distinguishing the goods or services from that of another enterprise

According to the USPTO, the IP system hopes to “foster an environment in which creativity and innovation can flourish.” In doing so, the system also creates financial incentive, economic growth, and morality among consumers and businesses.

Protecting Consumers

The IP system helps protect consumers from unsafe, unreliable, and unauthorized goods. The system ensures products are authentic and allows consumers to build confidence in the market. Counterfeit goods have the potential to cause sickness, injury, and even death. For example, mock electronic products can often have inferior lights, wires, sockets, batteries, circuit breakers, and timer fuses. IP protection within the pharmaceutical industry is especially important as the emergence of counterfeit medicines is, as noted by the Food and Drug Administration, fake medicine. Counterfeit drugs may be contaminated, contain the wrong or no active ingredient, or contain the right active ingredient at the wrong dose. Over 10 percent of pharmaceutical products in the global supply chain are reportedly counterfeit. Interpol, the International Criminal Police Organization, recently warned consumers that many diet pills available over the Internet are especially dangerous and can put users at risk of heart attack, stroke, and mental breakdown. In attempts to crack down on the counterfeit drug

industry, Interpol’s largest operation targeting counterfeit drugs spanning 111 nations resulted in the seizure of over 9.6 million tablets worth \$32 million, the closure of 12,000 websites, and 434 arrests.

Protecting Businesses

Counterfeit goods as a whole have distinct effects on the economy. They create unfair competition with the genuine product, which causes a loss in revenue and disincentivizes innovation. This in turn can cost jobs where the sales of originals are diminished by fakes resulting in insufficient revenues. Overall, fake goods undermine economic growth and hurt the reputation of the original brand. By protecting intellectual property, the IP system incentivizes inventors, businesses, and entrepreneurs to develop new advances, furthering innovation.

Strengthening the Economy

The World Intellectual Property Organization (WIPO) reports the IP-intensive industry employs over 55 million Americans and hundreds of millions of people worldwide. Employees within the industry earn approximately 30 percent more than those in non-IP positions, and jobs within this industry are expected to grow faster over the next decade than the national average. On a national level, IP in the United States is worth \$5.8 trillion, accounting for 38 percent of total U.S. GDP and 74 percent of all U.S. exports. The protection of intellectual property is essential. Doing so protects jobs, promotes economic growth, spurs innovation, and ensures product quality. ◀



2014 Job Market Recap

Olivia Ferguson

December Figures

The year 2014 ended with the addition of 252,000 jobs to the economy and a decline in the number of unemployed persons by .2 percent (383,000 persons) bringing the unemployment rate down to 5.6 percent – the lowest level since June 2008. Among the major working groups, the unemployment rate for adult women showed the most significant change dropping by 0.2 percent, while the employment rate for adult men, teenagers, whites, blacks, and Hispanics showed little change. Long-term unemployment remained unchanged overall. In addition, involuntary part-time workers saw little change as well, but there was a decline in discouraged workers.

Industry Growth

The industries that came out on top this year include professional and business services, construction, health care, restaurants, and manufacturing. Employment in professional and business services saw the largest growth in December, adding 52,000 jobs. The construction industry added 48,000 jobs in December – a high figure for the winter considering the seasonally diminished number of construction jobs. Overall, the housing industry saw growth, as building permits increased and builders moved from constructing multi-family homes to building single-family homes. Jed Kolko, economist at Trulia, says, “The December 2014 jobs report was a big win for housing. Residential construction jobs kept steady pace, job growth in clobbered metros continued to be strong, and—best of all—the share of young adults at work reached a six-year high.”

Manufacturing employment increased by 17,000 jobs for December, and health care also saw a significant increase, adding 34,000 jobs in December.

Retail Sales

The U.S. retail sales industry experienced its largest decline in 11 months in December, as demand for consumer goods across the board declined. Retail sales fell 0.9 percent, a much greater decline than the expected 0.1 percent following the 0.4 percent increase in November. However, in light of the overall growth of the economy, economists consider the decline as temporary due to the strengthening labor market and low gas prices. The figures are partially attributed to difficulties adjusting after the seasonal fluctuations in spending during the holiday season.

2014 Growth

The year 2014 as a whole saw significant growth in employment across a number of major industries. Compared to 2013, both manufacturing and health care grew at greater average monthly rates. In 2014, manufacturing grew by 16,000 jobs per month on average, compared to an average of 7,000 per month in 2013. Similarly, health care added 26,000 jobs per month on average in 2014, compared to an average of 17,000 per month in 2013.

Overall, jobs were added to the economy at a higher monthly rate in 2014 than the previous year. 2014 saw an average growth of 246,000 per month, while that for 2013 averaged 194,000. In addition, 2014 saw a decline in unemployment by 1.1 percent, as well as a decline in the number of discouraged workers and the number of long-term unemployed individuals. Overall, in 2014 the U.S. created 2.95 million new jobs representing the largest gain since 1999.

Despite the economic growth, the average workweek for employees on private non-farm payrolls remained unchanged from the previous year at 34.6 hours in December and wages slightly dipped by 5 cents per hour following an increase of 6 cents per hour in November. Average wages stand at \$24.57 per hour. In the last year, wage growth has been slow. Growth in average hourly earnings has slowed to 1.7 percent in

the last year from an average of 2 percent since 2010 – two-thirds faster than the historically normal growth rate. Dan Greenhaus, managing director and chief strategist at global equity trading and fund services firm BTIG says,

“Unfortunately, as great as the headline is, the wage data severely complicates matters. Average hourly earnings actually declined 0.2% in the month and the previous month was revised down. The simple fact is we cannot consider an employment report a success, no matter how healthy the headline may be, if wage data does not begin to accelerate.”

Economists had predicted that the tightening labor market would result in a boost in wages, but this has not been the case. Furthermore, the lack of movement in wages has been cited by the Federal Reserve as the reason for interest rates to remain low. However, John Ryding and Conrad DeQuadros of RDQ Economics assert,

“There will be those who point to the drop in average hourly earnings as suggesting the Fed can wait longer but the downward momentum in unemployment likely points to a sub-5% reading on the unemployment rate by the third quarter of next year and higher wages down the road (our view is the drop in wages is likely to be a quirk that will be reversed). Moreover, real wages likely rose in December because of the drop in gasoline prices. We think the Fed remains on track for a liftoff in rates in the second quarter and, given the strength of job creation and pace of reduction in labor market slack, we suspect there will be more at the Fed who wish that patience hadn’t been defined in such a way as to suggest that a March move is unlikely.”

Analysis

The general economic growth experience by the U.S. in 2014 has set the nation up for a strong 2015. Economists expect the improving job market to create a boost in consumer confidence, which in turn will spur economic growth. The public is already feeling some benefits of strong consumer confidence, including extraordinarily low gas prices and low mortgage rates. Bloomberg economists suggest this consumer confidence is primarily a result of the boost in job security indicated by the company’s Bloomberg Consumer Comfort Index which reached 43.6 as of January 4. This is the highest level since October 2007 suggesting fewer dismissals in the workplace, fewer workers registering for unemployment benefits, and the retention of seasonal hires. A tightening labor market is forcing employers to hold onto workers, as economists believe it is becoming more difficult to fill vacancies. As mentioned, they also believe the

tight labor market will boost wages, but so far there is little evidence of this. Stuart Hoffman, Chief Economist for PNC, remains hopeful, saying, “Faster wage growth remains the missing piece of the puzzle, but with the unemployment rate declining further and 21 states raising their minimum wage starting this month, wages should accelerate as 2015 progresses.” ◀

Borrowing Time:

New Revenue Strategies for Utilities

Kyle Burgess

Benefits and Drawback of Declining Water Consumption for Water Utilities

In the last several decades, water consumption relative to population size has been declining in the U.S. According to the U.S. Geological Survey (USGS), national water use peaked in 1980 and has remained fairly consistent. Although typical stresses for increased water use – population growth, increased water-dependent industry, increased irrigation for food cultivation, etc. – have risen since 1980, total water consumption has not. “This shows that water conservation efforts and greater efficiencies in using water have had a positive effect in the last 35 years,” says the USGS.

Declining water use has simultaneously been a helpful and harmful trend for water utilities. In order to continue providing adequate water services (such as drinking water and wastewater systems) to a growing population via the existing infrastructure, utilities have benefited from decreased water consumption. Without decreased consumption, water utilities may have faced shortages or other serious issues that could result from overburdened infrastructure, such as the spread of waterborne illnesses or the discharge of pollutants into rivers, lakes, and oceans.

Although improved efficiencies and decreased consumption are good for water utility companies and consumers alike, water utilities are struggling to remain profitable as consumers increase water conservation efforts, which consequently decrease utilities’ revenues. This is a particular problem in drought-prone areas, such as those in Southern California and Arizona, or in environmentally conscious cities, such as Seattle, Portland, Cincinnati, and San Francisco.

Until infrastructure improvements are financed and carried out, there is some relief for water utilities and consumers in the interim. Analytic software can help water utilities understand how water conservation and changes in general water use patterns are impacting their revenue. For example, Valor Water Analytics provides subscription-based software that delivers a

suite of customer sales and water use analytics that can help utilities be more effective in aiding their customers with utility bill management by designing estimated budgets and payment plans around their actual usage rates.

Implementing Analytic Software

Historically, utilities across the board have tended toward increasing usage rates to remain financially viable, while also improving revenue by minimizing inefficiencies to cut costs. However, with the aid of analytic software, some water utilities are employing dynamic pricing, attempting to aim rate increases at consumers who are “wasting” water as opposed to raising overall rates. This strategy is intended to target “bad actors,” as opposed to those who are making efforts to conserve in times of drought or to be environmentally conscious in general. Furthermore, utilities can employ such software to attain unrealized revenue that is unrelated to usage rates altogether. How does this work, though?

In the case of Valor Water, the company’s software tools closely monitor fixed versus variable revenue (i.e. disaggregated revenue data), so utilities can track and develop more revenue stability through informed rate planning and revenue forecasting. Shifting rate structures is not the only way such software enables cost savings. According to Valor Water’s founder Christina Boyle, “It can help locate inefficiencies in the billing and meter systems where the utility is missing opportunities to collect revenue, for water already delivered (‘hidden revenue’).”

The software employs data mining of utilities’ billing information to provide diagnostics that Boyle says can be used for “identifying and addressing habitual non-payers (residential and commercial), locating mis-classified customers in the billing system, identifying mis-sized meters, identifying heavy irrigators and mandating irrigation meter installs, and more.” Boyle emphasizes that utilities don’t just benefit from centralized dashboards like those included with the software her company makes for water utilities. “We

run the analytics but we also deliver advising and insight... we layer it with suggestions," she explains. "Utilities were so hungry for this information." According to Boyle, utilities hadn't been regularly analyzing usage data and only infrequently hired data analysts and consultants to review usage data or create spreadsheets. With over 50,000 water utilities in the U.S. there is significant "hidden revenue" to be generated from implementing efficiency software.

Valor Water Analytics estimates that it locates roughly .5 – 3% of "hidden revenue" for its customers. In other words, a water utility company with 150,000 customers and an annual operating income of \$46 million that employs Valor Water Analytics software could save \$230,000 to 1.4 million annually in "lost" operating income. Although .5 - 3% doesn't seem like much of an increase, such savings can significantly strengthen the financial position of utilities if they are highly leveraged (i.e. have a lot of debt), have flat or declining revenues (due to drought or water conservation) accompanied by increasing expenses (from system improvements), or their cash flow is restricted or tied up in investments.

According to Boyle, "The implications of the aforementioned are that Valor Water's cost savings will help reduce [utilities'] expenses, increase revenue, increase liquidity (more cash that isn't restricted), and can help reduce leverage (pay down debt)." Achieving any increase in revenue during a time of declining water use without hiking up usage rates is valuable to utilities, as it keeps them afloat without provoking consumers – which isn't uncommon with utility rate hikes. To finance the much needed infrastructure improvements, it's more than likely that water utilities will increase rates regardless, but that should not excuse water utilities from utilizing tools that can improve their financial position without placing undue burden on consumers.

Data Analytics for Other Utilities

As discussed in the previous issue of the Consumers' Research Bulletin, internet service providers (ISPs) could significantly benefit from dynamic and other pricing options, so it stands to reason that data analytic software similar to that described above could be useful to these ISPs in achieving unrealized revenue. Additionally, natural gas providers that also experience some of the same challenges faced by water utilities – unrealized revenue due to inefficiencies, habitual non-payers, mis-classified customers, etc. – may also achieve similar gains by employing data analytic software.

Electric utilities across the nation have already begun to execute data analytic technologies; however, the smart grid does not seem to hold the same promise for electric utilities and their customers as data analytic

software does for water utilities and their customers. In the next issue of the Consumers' Research Bulletin there will be a follow-up article to this one on the U.S.'s aging energy infrastructure, the implementation of smart grid technologies, the security of the data generated by smart grid technologies, and the implications of dynamic and other pricing models (i.e. the cost to consumers). ◀

Gas Prices Update: The Impact of Low Prices on Electric Vehicles

Olivia Ferguson

As of January 5, the gas price national average stood at \$2.199 after a steady decrease in prices since June. By the final day of 2014 gas prices dropped below \$2.00 per gallon in four states. Since the New Year, average national prices have continued to fall at a 1-cent-per-week rate, hitting a six-year low of \$2.03 on January 26. The abnormally low winter prices are attributed to high domestic production rates, declining crude oil prices supported by OPEC's decision not to restrict oil production, as well as moderate weather in the Gulf of Mexico for 2014 which has allowed continued year-round production on oil rigs.

Concern for Electric Vehicles

Not everyone is rejoicing over the low prices though. Some are concerned cheap gas will have an inverse effect on the sale of fuel-efficient vehicles, including electric and smaller vehicles – the sale of which has been historically linked to fuel costs. A recent Bloomberg article suggests electric vehicles (EVs) are the facet of the alternative energy movement that will be most affected by highly affordable gas. While high gas prices make fuel-efficient cars more appealing, the converse is also true, leaving EVs in a precarious position if gas prices stay down. Mass-market models, such as the Nissan Leaf and Chevy Volt, have experienced a drop in sales since June 2014 when gas prices began to decline. Moreover, December 2014 saw a sudden surge in pick-up truck and large SUV sales – vehicles notorious for their high fuel consumption. Not to mention, Tesla stocks dropped in correlation with gas prices, implying investors may expect trouble ahead for the green car movement.

Other Motivations

Those pointing to lower fuel consumption as the primary motive for buying hybrid or plug-in vehicles fail to take into account other factors EV owners may consider to be higher priorities. According to a survey conducted by the Center for Sustainable Energy in

San Diego, 38 percent of Nissan Leaf owners cited environmental concerns as their primary reason for buying an EV, 20 percent cited financial savings, and 16 percent identified access to HOV lanes.¹ The “J.D. Power 2014 Avoider Study” indicates that new-vehicle buyers who purchased an EV were most likely to say they did so due to environmental concerns than for better gas mileage. These studies indicate that if consumers are more likely to buy electric vehicles due to concern for the environment, low gas prices should not have a significant impact on their decision since the goal driving the purchase is to attain a greener lifestyle.

Signaling Theory/Conspicuous Consumption

Popular culture also plays a role in the decisions made by consumers. Today, environmentalism and sustainability are considered moral indicators entrenched in popular culture. “Going green” has become so prevalent in some places that not erring on the side of sustainability is considered a gossip-worthy offence. As put by Steve and Alison Sexton, co-authors of “Conspicuous Conservation and Private Provision of Public Goods,” individuals make consumer decisions in order to gain economic power by means of signaling a public good. The term “conspicuous conservation” (a derivative of “conspicuous consumption,” which means the spending of money on luxury goods and services to display economic power) specifically refers to the engagement of activities that are environmentally friendly in order to gain a higher social standing. A well-known example noted by the Sextons is how some individuals install solar panels on the front of their homes, despite the front not being the sunniest side, because they want their neighbors to see the new additions. Published in 2011, the paper examines the motives behind buying EVs (specifically the Toyota Prius), and the perceived value of buying an EV within green communities versus “brown” communities (those in which environmentalism is not as prevalent). The Sextons found that the Toyota

¹ In the state of California, electric vehicles are permitted in the HOV lane regardless of the number of occupants in the vehicles.

Prius, one of 24 hybrid vehicles for sale in the U.S., held a disproportionate share of total U.S. hybrid sales at the time, especially in green communities. According to the Sextons, the Prius owes its popularity to its distinct design. In other words, because the Prius is easily recognizable, more people chose to buy it despite there being a variety of electric models on the market of similar quality and price. “Going green” has become such an engrained part of popular culture it is unlikely the trend will fade away. Because sustainability and environmentalism now carry social value, consumers (especially those in green communities) are likely to continue buying EVs despite low gas prices.

What About Tesla?

As mentioned, the high-end luxury EV company has been a point of focus for industry experts due to the drop in stocks. Adam Jonas, analyst at Morgan Stanley, forecasts the company to miss its 2020 sales target by 40 percent due to the challenge of selling the new mass-market Model 3 while gas prices are low. He states, “While nobody buying a Model S today [at a price of nearly \$105,000] is doing so to save on their monthly expenses, the longer-term story is far more dependent on the volume of success of the Model 3.” A fluctuation in gas prices is unlikely to affect the purchasing decision of consumers in the market for a luxury electric vehicle. In terms of the Model 3, however, the company’s dependence on its success is believed to be a hindrance. That said, the Tesla brand is known for its high quality performance and user experience. In an online forum hosted by Tesla Motors, when asked “Why DID you buy a Tesla?” the majority of respondents cited “going green” as their reasoning, with one respondent quoted as saying the features of the vehicle “seemed totally worth the extra money to go 100% electric and have a much nicer car.” As put in a note to investors by Ben Kallo, analyst for Baird Equity Research, “Tesla vehicles are purchased for performance, quality, and brand, which are minimally affected by oil prices.” The brand’s exceptional reputation will likely contribute to the appeal of the Model 3, which, when paired with the affordability of the model (expected to start at \$50,000) will spur sales for the growing population of individuals who want to go green.

EVs Will Live to See Another Day

Motivators to buy electric vehicles exist beyond fuel economy and therefore cannot be disregarded when determining the relationship between gas prices and fuel-efficient cars. When accounting for technological advancements, the affordability of new vehicles on the market, and today’s engrained value of sustainable consumerism, it seems unlikely low gas prices will significantly hinder the electric vehicle movement in the long run. ◀

The Extension and Expansion of the Prescription Drug Return Program

Millan Bederu

In September 2014, the U.S. Department of Justice (DOJ) announced an expansion of the prescription drug return program in an effort to curtail the frequency of prescription drug overdoses. Prior to the program's expansion, prescription drug return was limited and disposal was largely the responsibility of the prescriber. Under the new regulations, the public is now able to return unused prescription drugs to pharmacies, hospitals, and clinics. Long-term care facilities will also be able to collect unused prescription medications from residents in their facilities. Most notably prescription drug users and their relatives are now able to mail unused prescription drugs to collection centers. This initiative is an extension of a prescription drug "take-back" program launched by the U.S. Drug Enforcement Administration (DEA). In November, the program reported a collected total of over 4.8 million pounds of prescription drugs after tallying the results from its 9th National Prescription Drug Take-Back Day in September.

The drug return program began in 2010 and was accompanied by the Secure and Responsible Drug Disposal Act of 2010 signed into law by President Obama. The Disposal Act and the drug return program were enacted to amend the Controlled Substances Act of 1970, which does not provide a legal method for transferring possession of controlled substance for the purposes of disposal. The new regulations were presented in order for the DEA to incorporate the Disposal Act into enforcement practices.

Drug disposal efforts have been undertaken to combat what the Centers for Disease Control and Prevention (CDC) calls an epidemic of prescription drug abuse. Attorney General Eric Holder, called the present state of prescription drug abuse "a public health crisis." A study conducted by the U. S. Department of Health and Human Services states that opioid analgesics (painkillers) were involved in 60% of drug overdoses in 2010 and now outnumber overdose deaths resulting from all illicit drugs combined. Opioid related drug overdoses resulted in more than 16,000 deaths in 2010 and accrue an estimated \$72 billion in medical costs each year. Opioid analgesics are only one

class of commonly abused prescription drugs and include drugs like Vicodin, OxyContin, and Lortab. Stimulants, like Adderall, and depressants, such as Xanax or Valium, are other types of prescription drugs that are also commonly abused.

According to a CDC brief on prescription medication use, Americans are currently using more prescription drugs than in previous years with a 10 percent increase over the past 10 years. Spending for drugs in 2008 was double what it was in 1999, adding up to \$234.1 billion. Furthermore, the number of patients that used two or more prescription medications also increased from 25% to 31% over a ten year period. Given the large amount of prescription drugs in circulation, the DOJ and the DEA hope to create more convenient disposal methods for consumers.

Unused medications tend to be difficult to dispose of due to the regulations set forth in the Controlled Substance Act (CSA). Though state, local, and tribal authorities have previously held drug take-back events, segments of the CSA have restricted the disposal of some of the most harmful pharmaceutical drugs. Many of the states that do allow drug returns will redistribute unused and sealed medications to residents in need. These programs are instituted by state laws and usually do not allow the donation of controlled substances.

The National Conference of State Legislatures identifies 38 states as having drug return laws, some of which are not operational. Though these programs are widespread, there are strict restrictions on who can donate and the allowable conditions of the drugs donated. State laws often require that participation is restricted to health care facilities and pharmacies only. Controlled substances can therefore sit unused in medicine cabinets where children, teenagers, and other unauthorized users can obtain them. Most unauthorized users of prescription medications first obtain the drugs from close family members or friends who are legitimate users. The DOJ says 4 in 10 teenagers who have used unauthorized prescription drugs acquired them from their own parents.

The CSA stipulates that patients must dispose of prescription medications themselves. Previously, the most practical method of disposal has been to either flush or trash drugs, which consequently could result in pharmaceuticals entering groundwater and landfills. The Food and Drug Administration and the U.S. Environmental Protection Agency (EPA) provide general guidance for drug disposal, recommending medications be mixed with cat litter or coffee grounds to prevent children or pets from attempting to ingest the drugs. Specific drugs also pose certain threats to the environment and require special disposal procedures. In cases like these consumers must consult a trained pharmacist or read the specific instructions on medication labels. The EPA warns that improper disposal could result in drugs entering the water supply. The DEA hopes this initiative will serve to curtail some of the potential environmental damage done by flushing and trashing medication.

Consumers may return drugs on local prescription drug take-back days, as well as at participating health care facilities and pharmacies. Local facilities like libraries and police stations will also provide special mail-back packages for consumers to mail unwanted prescription medications. Prescription drug users and family members may drop off or mail back prescription drugs without providing personal information including the names of patients, prescription information, or physician information. All collected medications will be safely stored at registered collection sites until they can be disposed of according to DEA standards. ◀

The Results are in: Soylent, *The Food of the Future?*

Joseph Colangelo

The Idea

Necessity is the mother of invention, and in December of 2012, Rob Rhinehart had a need. He was spending too much time and money obtaining, preparing, and eating food. At the time he was working on a start-up in San Francisco that, by his own take, was not working out. With little income and even less time, he began thinking of ways to “hack” his diet. After trying McDonald’s and kale-only diets (quite a dichotomy) and ending up either a physical wreck or incredibly hungry, Rhinehart began considering the idea of food itself on a more basic level.

What is food? Food looks like meat, grains, fruits, and vegetables. The truth is that humans only eat these items because of the protein, fiber, vitamins, minerals, and important nourishing elements that are inside of those meat, vegetables, and other types of food. In addition to these important components of food, though, there are things the human body either does not require or requires in much smaller amounts than are found in the foods we eat. As a result, this waste is either stored in the body as fat or deconstructed and jettisoned through the waste system.

When people talk about eating a balanced diet, they aim to optimize the food eaten so that it contains all the necessary ingredients to survive and thrive with as few of the unnecessary ingredients as possible.

Rhinehart’s premise, then, was to create a product that would be perfectly optimized. In order to do this he skipped all foods and went straight to the raw

ingredients. Rather than adding foods rich in vitamin C, Rhinehart used vitamin C. Rather than breaking down meat protein, Rob used broken-down rice protein.

The Company

Anyone who has seen the 1973 film “Soylent Green” might find it strange that a company would choose to name its meal replacement after the food of the dystopian future that was literally made of ground-up human beings. Gross, right?

Well, Soylent Green was not only made of people, it nourished people. In the absence of fresh food in the future, people were able to survive on the ubiquitous substance. So, while the reference is rather dark, it makes sense to someone with the mind of an engineer such as Rhinehart.

The order process left a great deal to be desired. I initially backed the project by purchasing one month’s worth of Soylent in September 2013. At that time the

product had an expected ship date of January 2014. By January the ship-date had slipped to February, then eventually April. On April 30, 2014 I was told that my Soylent would ship that same week. I didn’t receive my Soylent until July 2014, over 9 months from when I initially placed my order.

Currently the company’s website advertises that it will take 4-5 months for new orders and 1-2 weeks for reorders. For those wondering why the disparity, they offer the following explanation:



“Unprecedented demand for Soylent has overwhelmed both our initial manufacturing capabilities and the capabilities of our suppliers. While we have shipped over three million Soylent meals to date, the remaining backlog of orders has resulted in an estimated four to five month delivery time for new orders.”

The Experience

Day 1, the optimism:

My initial thought is that this is what pancake mix would taste like if made of paper. I can't really place it other than not tasting like or having the consistency of food. After the first 5 hours and the consumption of 600 calories of Soylent I'm still not hungry, and I'm also very focused. Afternoon Soylent turns out to taste a lot like morning Soylent, which in turn tastes a lot like evening Soylent, which in turn is a boring taste. It's nighttime and I'm hungry, the hunger I was expecting shows up.

Day 2, the hangover:

Three thoughts to start the day:

1) I've begun to notice the digestive effects that people talk about. In order to favor brevity, I'll just come out and say it... I fart a lot. Here's what Soylent had to say regarding a recent update to the formula:

"Today, we are extremely happy to announce Soylent 1.1, our first revision to the original Soylent formula. Starting today, all orders will be fulfilled with Soylent 1.1. We have made two changes to the 1.0 formula, resulting in a food with greater neutrality and digestibility (as indicated by preliminary tests). Sucralose has been reduced from 60mg to 30mg per pouch and a blend of digestive enzymes (Alpha-galactosidase and proteases) have been added to the formula."

That's a lot of dancing around the subject. What they're actually saying is that it should make people less gassy.

2) I'm very hungry.
3) But not for Soylent.

As the day continues, I offer myself my first exemption from the Soylent-only diet, a green tea, of which I only take a few sips. It helps with the headache, which may have resulted from not taking in enough calories the day before.

Evening day two is rough, not because I'm feeling bad (I'm actually feeling quite good), but because my kids' preschool is hosting a pajama pizza party that evening, and the temptation is painful to endure. I endure.

Day 3:

Eh.

I wake up and my wife is making cinnamon rolls for the kids. I think this is what my peers feel when they say "I can't even." I can't even. It smells good. More Soylent and I don't have any headaches.

Days 4-7:

If there was a hill to climb or obstacle to pass I have passed it. By the end of day 4 I'm confident that I could survive on Soylent for the rest of my life. I would miss coffee and scotch and sharing meals with my friends and family. I'm ready to begin incorporating regular food back into my life but I'm aware that I don't have to. I wear a suit for the first time in a few days on day 7 and there's some serious slack in the waist. I've lost 5 pounds. While this wasn't the goal, I'll certainly take it.

The Take-away

Soylent is weird because it's not close to anything that we are used to seeing or eating. It shouldn't be written off because it is unknown. It can save time for professionals who want to cram more work into the day. Soylent can also save money for students looking to eat healthy without buying expensive food from the grocery store. Finally, if it can accomplish these goals and make money, it can be a tool in the fight against global hunger. Just don't hold your breath waiting for this company to deliver your first order. ◀

Is American Health Care *more affordable*, or is it **too soon to tell**?

Millan Bederu

Open enrollment for health care obtained through exchanges established by the Affordable Care Act (ACA) is coming to a close (running from November 15, 2015 to February 15, 2015). As employers and insurers devise cost projections, consumers must decide how to navigate health care insurance coverage's new terrain. This article looks into the costs and trends of health insurance and how the ACA is affecting consumers' health care options as well as the greater market implications of the Act's second year.

After the ACA's first year of implementation, the broad picture of how health insurance has changed is hardly clearer than before the Act took effect. As consumers sweep through the second round of open enrollment, some new features of the exchanges should be examined. For starters, consumers who are already enrolled in a health insurance plan through government exchanges or marketplaces should look into how their plans have changed going into the new enrollment period. Some plans are expected to have higher premiums while other plans may have disappeared altogether. Penalties are also slated to increase in 2015 for those who decide to remain uninsured. The fees double or in some cases more than triple this year, as the uninsured are required to pay a penalty of 2 percent of their income or \$325, whichever is higher, up from 1 percent of income or \$95 in 2014.

Health Care Costs

The big debate in the implementation of the ACA has been costs. Opponents of the ACA assert that the new policy will lead and has led to spikes in health care costs. The Obama administration has countered this assessment saying the rate of increase has been slower than the years preceding the passage of ACA. "The bottom line is this: Under this law, the share of Americans with insurance is up and the growth of health care costs is down," stated Obama at a press conference in April of 2014.

Parsing out which evaluation is more accurate hinges on clearing up the subject of debate to begin with. Opponents of the ACA have asserted that health care costs are up since the passage of the ACA and the White House has not opposed this assertion. Costs are up. But the Obama administration argues that the rate of increase is smaller than it once was and continues to decrease. The administration maintains health care costs increase in almost any circumstance, at the very least as a result of inflation, but more likely because of factors such as increases in demand and higher risk within the insurance pool.

Cost of Premiums

By CR's calculations, using data provided by the Kaiser Family Foundation's annual Employer Health Benefits Report, the rate of increase for employer-provided single coverage premiums has slowed since the beginning of ACA enrollment. In 2007, the average cost of premiums for single coverage was \$373 per month, in 2008 it was \$392 per month. This corresponds to an average premium growth of 5.1 percent between 2007 and 2008. In 2012, the average monthly premium was \$468 per month and in 2013 it was \$490 per month, a growth of 4.7 percent.

The percentages in these calculations represent the amount the average premium for employer-provided benefits increased between the two given years. This means that though the rate of increase for premiums has slowed overall, the rate of cost increases is not necessarily lower for all or even most of the insurance plans that comprise this average. The ACA has allowed for certain segments of the population to qualify for greatly reduced premiums, which would bring the overall average increase in cost of premiums down without necessarily reducing the increase in cost of many policies. For example, higher numbers of young people have entered the insurance pool, most of whom pay premiums which are lower than that of the average premium holder. Persons with pre-existing conditions would also see greatly reduced premiums, which would marginally lower the average cost of premiums.

In addition, figures from before the implementation of the ACA suggest the rate of increase was already on its way down. The downward trend in the increase of health care costs began in 2002 after a crest of close to a 10 percent rate of increase. Despite this, the Commonwealth Fund's survey of premium costs from 2003 to 2013 has shown that the decrease has been especially notable since 2010 and the implementation of the ACA. Though the numbers suggest a decrease in the rate of cost growth, the cause of these decreases is not necessarily straightforward and the effects may not be significant to the average insurance purchaser.

Out-of-Pocket Costs

Aside from the cost of premiums, another aspect of health care costs that warrants consideration is total out-of-pocket costs. A study conducted by the Commonwealth Fund suggests the amount of out-of-pocket costs for employer provided insurance plans is on the rise and has been for the past ten years. The Commonwealth Fund found that employers have been shifting larger portions of health care costs to employees through co-payments and deductibles for single coverage plans. In other words, the plans employers select may have lower premiums, but also have higher deductibles and require higher co-payments. The study showed that average out-of-pocket costs, which account for the sum of the average employee's share of premiums and average deductibles, as a percentage of median incomes increased from 8.4 percent in 2010 to 9.6 percent in 2013.

Cost to Insurance Companies

Another aspect of the cost calculation is the cost to insurance companies. While insurers are currently shifting policies to comply with ACA mandates, the sustainability of these policies is unknown. Instability in the insurance market could blow back on taxpayers and policyholders. Current concern over the implementation of the ACA is the make-up of the insured population. High numbers of unhealthy policy holders, which are not mitigated by higher numbers of healthy policy holders, would cause instability in the pool of insured persons. According to health policy expert Robert Laszewski of Health Policy and Strategy Associates, it could take up to three years for insurance companies to begin losing money if policies are not well-balanced. It may take years to fully understand the full scope of the ACA's impact. The instability that may follow the implementation of the ACA could possibly blow back on policy holders, as insurers would increase policy premiums in order to mitigate losses from an imbalanced pool. Taxpayers may also shoulder some of the burden as allowances in the ACA provide for the government to move tax

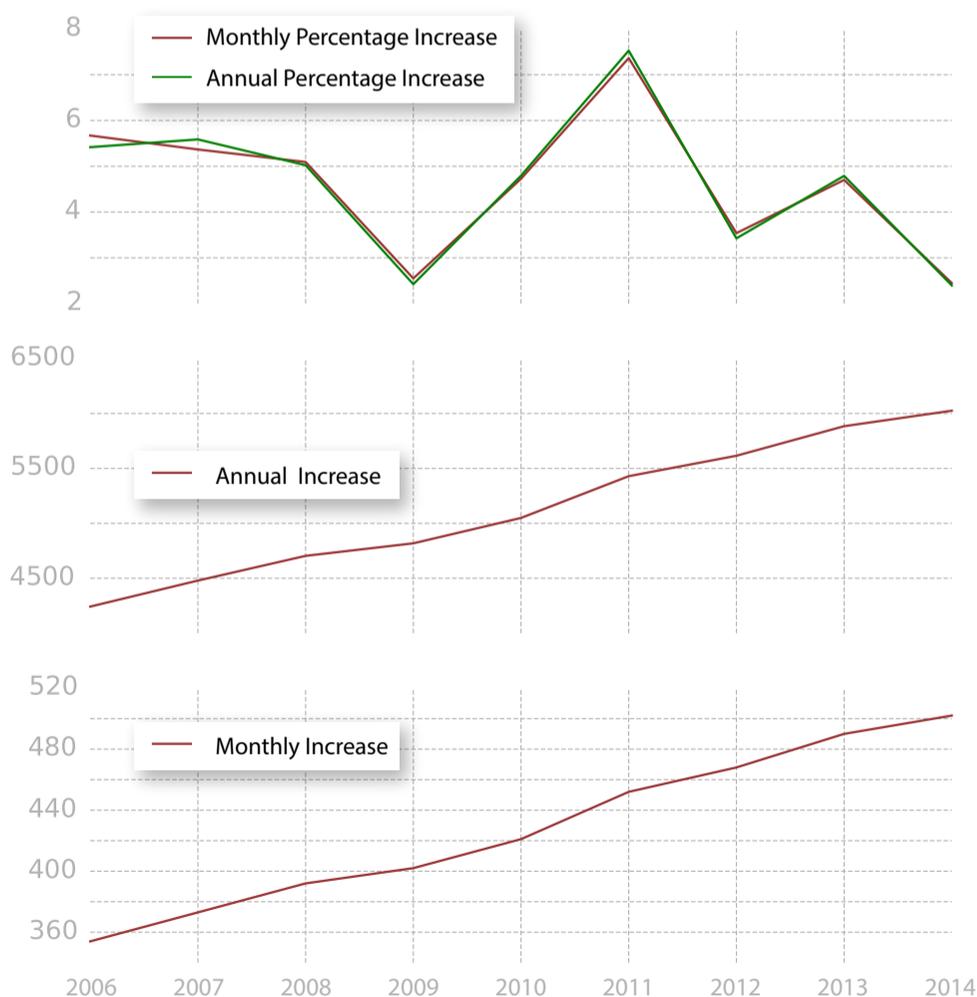
dollars to exchanges that suffer losses. These safety nets for unsuccessful exchanges are meant to be funded by profits made on other exchanges which are more successful, but if insurers make losses across the board then taxpayers may be expected to foot the bill. Currently, ACA opponents in Congress have introduced a bill to strike this section of the ACA and there is a Supreme Court case on the docket to determine the constitutionality of this aspect of the ACA.

Effects for the Uninsured

Despite the ambiguity surrounding costs, the ACA has successfully increased the number of individuals insured in the United States. A 2014 RAND Corporation survey found that 9.3 million more people were insured in 2014 than in 2013. Medicaid expansion in certain states as well as the under-26 extension have played a part in getting more people covered but a large portion of newly insured people were covered under employee sponsored programs.

Overall the future of health care and health care costs as mapped out by the ACA is murky at best. The landscape will no doubt settle with decisions from the Supreme Court and Congress expected in the months to come. Consumers will be best served by paying attention to shifts in legislation at the state and federal levels. ◀

Premium increases by Year



Source: Kaiser Family Foundation