

**New Business Models and the Need for Regulatory Change:  
Punctuated Equilibria, New Business Models, New Sources of  
Power, And New Abuses of Power**

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**Abstract**

New technologies create new business opportunities, including creating new business models, with new sources of profitability and new sources of power. New sources of power almost invariably create new abuses of power, which frequently are not adequately controlled by existing laws and regulations designed to limit corporate abuse. We use the punctuated equilibria or cladistics view of evolution, proposed by Gould, to explore the dramatic new business models associated with digital transformation. We explore new sources of power enjoyed by online digital platforms and the value that they create for their users. We also explore the ways that their power falls outside of traditional regulations, most especially outside of competition (anti-monopoly) law and consumer protection regulations.

**1. Introduction**

The principal argument of the paper is quite simple: New technology can create discontinuous change, enabling new strategies and new business models. New business models often create new competitive environments, including new sources of power and profit. New sources of power can lead to new forms of abuse of power, not adequately addressed by existing market forces or by existing regulatory regimes. Finally, when it becomes clear that these abuses of power will not be addressed by existing mechanisms, or that these abuses will not be addressed quickly, then new forms of regulation are required. We have described this in detail from the perspective of information systems and information systems economics in a recent text, *New Sources of Power and Profit* (Clemons, 2018). We have described it from the perspective of law and regulation in another recent text, *Your Privacy is Very Important to US* (Trzaskowski, 2021b).

A single example will help clarify conditions under which existing laws and regulations can need to adapt and evolve, to accommodate changing market conditions resulting from new uses of information and of information technology. Consumer protection laws do not exist to prevent consumers from making bad decisions; consumers are free to buy calorie-dense low-nutrition fast food, and adult consumers are free to buy cigarettes. Consumer protection laws exist to ensure that consumers have an opportunity to make good and informed decisions. When consumers bought meat, dairy, bakery goods, and produce from their neighbors, information asymmetry

was limited. Buyers and sellers knew each other personally, and the sort of surprise represented by Sweeney Todd's meat pies in 1840s London was quite rare; indeed, Sweeney Todd was a fictional character, and the horror of his human meat pies was fictional as well. In contrast, as American food production and distribution industrialized in the 1880s and thereafter, information asymmetry increased, and consumers no longer knew what they were buying; the horrors of American meat packing were real and well-documented (Sinclair, 1906; Blum, 2018). This resulted in numerous regulations intended to reduce the information asymmetry. Inspections and certifications increased consumer knowledge of what they were buying, as did restrictions on harmful additives, and regulation of misleading advertising and unfair business practices likewise reduced information asymmetry. Whether or not these changes eliminated information asymmetry, they are generally believed to have addressed the worse abuses of industrialization. However, modern platform-based retailing has, once again, shifted the balance of information availability massively in favor of the seller and the platform operator. Platforms know individual consumers' willingness to pay, approaching perfect price discrimination and reducing consumer surplus (Shiller, 2020). Platforms know how individual consumers respond to different forms of advertising, in increased individualized manipulation (Ghose & Todri, 2016). If consumers have no brand preferences they may without their knowledge be led to make purchases not because a product is best for them, but merely because the seller has paid a promotional premium to the platform (e.g., Nottorf & Funk, 2013). Each of these platform strategies shift information advantage towards the seller and the platform. Whatever forms of consumer protection that were once adequate to ensure fair and symmetric access to information will now be insufficient, requiring stronger forms of consumer protection (Trzaskowski, 2022).

Section 2 describes evolution and punctuated equilibrium in biology. Section 3 extends this discussion and describes evolution, creative destruction, and punctuated equilibrium in corporate ecosystems. Section 4 refines this analysis, and focuses specifically on punctuated equilibrium and creative destruction that are caused by change in information and information systems. Section 5 presents and supports the essential relationship between changes in business that are enabled by information systems and the need for regulatory responses; it focuses on new business models, new forms of power, new forms of abuse of power, and the need for regulatory change. Section 6 addresses the most severe regulatory conundrums we face today. Finally, section 7

presents our conclusions. This includes our reasons for optimism as well as our reasons for pessimism, and then suggests the possibility of a new world order dominated more by giant platform corporations and their representatives, and less by nation-states and their representatives in organizations like NATO and the UN Security Council.

## **2. Evolution and Punctuated Equilibrium in the Biological Ecosystem**

The theory of evolution, as originally proposed by Charles Darwin, assumed that complex biological systems, that is, species, evolved naturally to become better suited to their environment. It was widely assumed that evolution was gradual and that it occurred at a more-or-less uniform rate (Darwin, 1872). Based on the historical record, Gould extended the theory to encompass cladistics, or *punctuated equilibria*, in which periods of relatively static species' change would be interrupted by far more rapid change (Gould, 2007), and this has been confirmed by empirical observation (Lamichhaney, 2022; Lamichhaney et al., 2016).

We note that Charles Darwin's theory of evolution and the origin of species was based on the careful analysis of data sets, using data sets he gathered on the voyages the Beagle, and performed over a period of more than ten years (Desmond, 2022). In contrast, Alfred Russel Wallace independently developed the theory of evolution (Camerini, 2022), based on abduction and pattern recognition. He noticed that tigers existed in various forms, from the Indian jungles to the vast snowy tundra of Siberia. He noticed that there were no tigers of any form on the eastern side of the Lombok Strait between the islands of Lombok and Bali. The final piece of the explanation that Wallace needed was that the water between Lombok and Bali was too deep to permit the emergence of a land bridge during any fluctuations in sea levels. From this he concluded, first, that God had not placed tigers on the globe wherever they might fit into a suitable environment, or he would have placed them on both sides of the Lombok Strait, and second, that tigers in both India and Siberia had evolved from common ancestors and that they had evolved different characteristics that enabled to fit the local conditions in all locations where they were currently found.

We will rely more on Wallace and on Gould in the work that follows than on Darwin. This is largely because predictive work is done before the data sets used by Darwin are available, and in our work have relied more on anticipation and pattern recognition. Assessing how changes in

information availability will affect business models and regulation in the future usually must be started before complete data sets are available.

### **3. Evolution, Punctuated Equilibrium, Creative Destruction, and Competence Destroying Change in Corporate Ecosystems**

When the business environment changes slowly enough, dominant firms can often evolve and maintain their dominance; this is termed *competence-enhancing* change (Anderson & Tushman, 1991). In the 1960s and 1970s it was common to refer to the mainframe computer industry as “IBM and the Seven Dwarfs, because IBM’s market share exceeded that of the seven other mainframe computer companies combined. The industry changed, and mainframes became faster and more powerful, but IBM’s dominance was never threatened by improvements to mainframe technology.

In contrast, such periods of incremental change are punctuated by discontinuities, periods of rapid change in which previously successful strategies may lose their effectiveness. These periods are characterized by *competence-destroying change* (Tushman & Anderson, 1986), in which changes can render a dominant industry participant’s strengths irrelevant and can set the stage for new entrants to emerge and rapidly become successful. In the 1970s massive corporate mainframe computers in remote centralized data centers began to be replaced with departmental min-computers, a trend that IBM initially failed to notice and to which IBM initially failed to respond. This enabled minicomputer manufacturers like Digital Equipment Corporation, Prime, and Data General to capture the market, which IBM had ignored. In the following decade IBM and Apple led the move into personal computers, a move that minicomputer manufacturers ignored, leading to the eventual disappearance of the companies that had dominated the market for minicomputers. Although the IBM personal computer set the standard for one of the industry’s two dominant designs, IBM was not able to manage the transition from the skills needed for a hardware company to the skills needed to compete as a software company, and the ultimate beneficiary of the IBM PC’s domination was Microsoft and not IBM. Likewise, Microsoft was slow to recognize the increasing importance of online and mobile computing, creating an opening for Apple iOS and Google Android, and allowing Google to seize control of internet-based online computing. The history of the computer industry illustrates waves of

competence-destroying change and waves of creative destruction.

It is often difficult for previously dominant firms to sense the changes that are occurring around them. Often their previously successful strategies, or the previously successful technologies, are still in the period of rapid improvement in the latter half of their evolutionary S-curve, while the newer strategies and the newer technologies that are going to replace them are still in the initial slow-growth period at the start of their own evolutionary S-curve. This clinging to strategies and technologies that are about to become obsolete, and the rejection of their replacements, was termed the *innovator's dilemma* by Clay Christensen (Christensen, 2011). Clinging to previously successful strategies at times of rapid change has been documented by numerous other authors in numerous industries, and it appears irrational only in hindsight, after the value of new strategies and the power of new technologies has become clear. Additional work in this area has been done by Hayes, Wheelwright, and Clark (1988), Tushman and Romanelli (1985), Henderson (1993), Hamilton (1986), and others

These discontinuities correspond to punctuated equilibria in biology. Schumpeter's *Creative Destruction*, where new industries replace and ultimately destroy others, does correspond to the replacement of one species by another in the biological world (Schumpeter, 1994 [1942]).

#### **4. Evolution, Punctuated Equilibrium, and Creative Destruction, Caused by Change in Information and in Information Systems**

While hundreds of scholars at dozens of universities have studied information economics and information-based strategy, one group stands out in the study of information-driven change in the strategies of firms and the structure of industries. The nexus of MIT and BU has produced volumes of work on the digital economy, led by Brynjolfsson, Parker, and Van Alstyne (see, for example, Eisenmann, Parker, & Alstyne, 2006; Parker, Van Alstyne, & Choudary, 2016; McAfee & Brynjolfsson, 2017). NYU scholars such as Anindya Ghose and Arun Sundararajan are known for their work on a range of topics, from electronic marketplaces to online search (e.g., Forman, Ghose, & Wiesenfeld, 2008; Oestreicher-Singer & Sundararajan, 2012). Andrew Whinston and colleagues from UT Austin (e.g., Kalakota & Whinston, 1997, 1996) as well as Jay Nunamaker and colleagues from the University of Arizona (e.g., Briggs, Nunamaker, & Sprague, 2007) have conducted fundamental research on electronic commerce. The group of

Helmut Krcmar at Technical University of Munich has studied the role of digital platform ecosystem for traditional companies (e.g., Hein et al., 2020; Schreieck, Wiesche, & Krcmar, 2021).

Avi Seidmann and Rajiv Dewan, during their joint time at the University of Rochester worked on a range of issues associated changes in product design and marketing facilitated by the Internet (e.g., Dewan, Jing, & Seidmann, 2003, 2000).

In contrast, the group at the Wharton School has produced the greatest volume of work that examined punctuated equilibria and made predictions about the future strategies of firms and the structure of industries. One of the group's earliest predictive works involved newly vulnerable markets and the competitive advantage of new entrants. Their study of Capital One in particular suggested that previously dominant firms were vulnerable to new entrants when the following conditions were satisfied (Clemons, Croson, & Weber, 1996):

- Markets were *newly easy to enter*, suggesting that barriers that had protected incumbents were no longer relevant
- Markets were *attractive to attack*, with a strong customer profitability gradient, which meant that new entrants could succeed with smaller market share if they captured the most profitable segments of the incumbent's existing customer base. This mean that scale alone would no longer defend incumbents.
- Markets were *difficult for incumbents to defend*, because asymmetric regulation or other factors prevented the incumbents from immediately matching the strategies of the new entrants.

At roughly the same time the group examined how information technology changed the risk profile associated with outsourcing. Information technology and online networks made it much easier to observe the detailed behavior of outsourcing vendors, reducing the principal-agent problem and reducing the risk of *shirking* or deliberate underperformance by vendors. Likewise, the networks used to communicate between client and vendor would be based on the net, rather than on propriety investments made by client or vendor, reducing the risk of post-contractual opportunistic renegotiation enabled by the shift in bargaining power created by relationship-specific idiosyncratic investments. This led them to predict significant increases in outsourcing of services, including business process outsourcing (Clemons, Reddi, & Row, 1993).

In the mid-1990s the group extended its work on newly vulnerable markets to include newly vulnerable channels and newly vulnerable online markets, and made predications about which

intermediaries would be vulnerable to encroachment into its sales channels by the primary producers of goods and services, and which would not. It was clear that airlines could safely encroach on their distribution channel partners and could safely offer reservations services themselves while slashing travel agent commissions. It was equally clear that although online grocery sales would eventually emerge, they would not be dominated by consumer packaged goods manufacturers, which could not risk offending dominant retailers by attempting to bypass them (Clemons & Row, 1998).

The earliest work in the information systems community on platform envelopment is due to Eisenmann, Parker, and Van Alstyne (Eisenmann, Parker, & Van Alstyne, 2011; Eisenmann et al., 2006; Parker et al., 2016). Their work focused on new business models and new business opportunities. As has become typical more recently, the Wharton group focused on the potential abuses of power associated with these new business models and the regulatory problems this would create (Clemons, 2018; Clemons, Schreieck, Hermes, Rowe, & Krcmar, 2022; Clemons, Waran, Hermes, Schreieck, & Krcmar, 2022).

## **5. New Business Models, New Forms of Power, New Forms of Abuse, and Punctuated Equilibria in Regulation**

We will describe several historical sources of problems that were not solved by market forces. We will use well-known examples from the industrial revolution to motivate our search for problems produced by digital transformation and the platform revolution. In section 6 we will use each example from the industrial revolution to highlight an area where we expect to find a problem today. Additionally, in section 6 we will explore why markets did not provide a solution, where regulation was required, and what regulation during the industrialization of Western economies can teach us about regulation of new business models during digital transformation. The material in sections 5 and 6 draws heavily on a paper on Social Welfare Computing (Clemons, Waran, et al., 2022).

### **5.1. Harmful and Addictive Products**

We have already addressed the problems associated with industrialized food production, using meat packing as our first example. The original secret recipe for Coca Cola contained cocaine

from coca leaves, hence the first part of the product's name, and massive amounts of caffeine from the kola nut, which provided the second part of the name (NIDA, 2012). As promised in Coke's ad campaigns, the massive amounts of the two stimulants did produce "the pause that refreshes" (Planet Retro, 2018); the stimulants also produced a beverage that was both harmful and addictive. Consumers could not readily determine the contents of processed packaged foods; the cost of testing each product was impossibly high for individual consumers. Likewise, consumers could not readily determine the contents of packaged beverages because the costs were too high. The Food and Drug Administration was created in 1906 to deal with issues associated with the lack of transparency regarding the quality of the nation's food supply and pharmaceutical products, and with the safety problems this caused. Its current mission can be read on the agency's website:

"The Food and Drug Administration is responsible for protecting the public health by ensuring the safety, efficacy, and security of human and veterinary drugs, biological products, and medical devices; and by ensuring the safety of our nation's food supply, cosmetics, and products that emit radiation." (FDA, 2022)

When individual consumers find the cost of inspection to be too high, market participants often do not choose to provide product transparency. The FDA was created to address this problem.

## **5.2. Misleading and Manipulative Advertising**

Just as it was difficult to the public to determine the quality of the food and pharmaceutical products in the marketplace, it was difficult for the public to assess the truth of claims made about products in their advertising campaigns. The cost of conducting multi-year studies on the effectiveness of medical treatments was certainly beyond the means of any consumer. The Federal Trade Commission was created in 1914 with a mission that overlaps the FDA's mission and seeks to reduce unfair and deceptive business practices (Federal Trade Commission, 2022). Both agencies address information asymmetries and the lack of transparency, but where the FDA focuses on safety and transparency in product quality the FTC places more emphasis on transparency and accuracy of claims about product quality.

## **5.3. Participation Externalities, Network Effects, and Natural Monopolies**

Telecommunications networks created their own forms of monopoly and regulatory problems.



The Interstate Commerce Commission (ICC) was created in 1887 to deal with problems in the pricing of rail service, in particular a problem with the fanciful name of “Long Haul Short Haul Evil” (McGuire, 1981; Clemons, 2018). Where only a single rail line existed, as between Iowa City and Chicago, shipping rates were high because there was no competition, while for longer distances with competing routes, like shipping between Chicago and New York, rates were much lower. The ICC sought to achieve “fair and reasonable” pricing in the absence of competition. The Sherman (Antitrust) Act of 1890 sought to ensure that competition remained viable where such competition was possible, and it regulated monopolies in oil, coal, and steel. Enforcement of the Sherman Act led to the breakup of Rockefeller’s Standard Oil Company (New York Times, 2012). And yet it was soon apparent that neither the ICC nor the Sherman Act were appropriate for regulating the emerging telephone system.

The problem with other forms of regulation is now clear. Where the existence of only a single market participant created problems in other industries, in telecommunications networks it was actually desirable to have only a single provider. It is well-known that the value each member of a communications network receives from the network increases rapidly and non-linearly as the number of participants increases; estimates like  $O(n \log n)$  or even  $O(n^2)$  are commonly suggested (e.g., Zhou & Van Alstyne, 2019). The simple and primitive switching technology available at the time limited interoperability across service providers, which meant that telephone company users could communicate only with other users within the same company. This was the world’s first *natural monopoly* (McCraw, 2009); regulators actually had a reason to want a single telephone company to emerge. And yet phone services and the emerging telecommunications industry was seen as too important to entrust to a single company.

The paradox was thus that while regulators wanted there to be only a single telephone service provider they also feared the power this monopoly would have. The solution in some nations, such as the UK, was to make telephone service part of the government’s own monopoly postal service. The solution in the US was both radical and radically different. AT&T’s own executives proposed what became known as the Kingsbury Commitment (Fung, 2013; "The Government and the A. T. & T. Company," 1914). AT&T would remain a monopoly. It would make all business strategy, investment, and pricing decisions itself, while implementing policies that were

agreed upon with the federal government in the Commitment. Among these was capping the company's earnings as a low percentage of the company's total investment in infrastructure, recognizing that the company's protected monopoly status meant that investment in AT&T should be treated more like investment in a low-risk bond than an investment in a traditional company's common stock. Additionally, AT&T committed to using profits from business customers, long-distance customers, and low-cost urban networks to subsidize service in rural areas, resulting in *universal service*.

#### **5.4. Platform Envelopment as a New Form of Monopoly Power**

Platforms and platform envelopment are usually seen as phenomena associated with digital transformation, but early forms of platform envelopment existed during the transition between the industrial revolution and the beginning of more modern forms of digital transformation.

A platform is generally defined as a core system that can readily be extended (Parker et al., 2016). Android, iOS, Windows, and OS X are probably the best-known software platforms today. Platform envelopment involves the combination of the following three characteristics: The first is *monopoly control over the core system*, making access to the core essential to any company that wants to work with the core's users. The second is *super-additive value creation* as each additional application added to the core creates more value for users, including increasing the value of the core and some or all of the applications already added. This makes the core even more attractive to its users, which increases the monopoly power of its owner. It also adds to the value of each application added to the core, making it difficult or impossible for a company to compete if its products are denied access to the core. Finally, platform envelopment includes the ability to deliberately *limit interoperability*, and thus to reduce access to the core or to deny access to the core entirely; this effectively cripples companies that seek to compete with applications created by the owner of the core (Clemons, Waran, et al., 2022).

Platform envelopment strategies have existed for decades. AT&T operated the world's first commercially successful radio station, WEAf, and created the first network when it used its Long Lines capability to link WEAf to WNAC in Boston. Since only AT&T had a long-distance communications capability, no other radio station could create a radio network. Other radio stations could exist, but they could not distribute their programming to other stations and thus

could not create a network of affiliated broadcasters. The Radio Commission, the precursor of the Federal Communications Commission, was created to address AT&T's platform envelopment strategy. The Radio Commission believed radio was too critical to be controlled by a single network and forced AT&T to exit radio (Clemons, 2018).

### **5.5. Online Gateways, Mandatory Participation, and New Forms of Market Power**

Online gateways represent a transition between traditional business models of the industrial revolution, which include manufacturing, retailing, and transportation, and the online services associated with digital transportation. Among the earliest and best-known examples of online gateways are the computerized travel agent reservations systems (CRSs) of the late 1970s and early 1980s (Copeland & McKenney, 1988). These were the subject of protracted litigation, and, perhaps surprisingly, this litigation continues today (Clemons, 2011b).

In the late 1970s American Airlines and United Airlines both decided that they needed additional hub cities, and they decided to use the manipulation of search to enable them to win over their new hub cities. American decided to locate its new hub in Dallas / Fort Worth and United decided to locate its new hub in Denver. However, Dallas was already the hub for Braniff, and Denver was already served by Frontier.

Control over a reservation system allowed American and United to destroy the established competitor airlines in their newly selected hub cities. American Airlines dropped Braniff (Airline A in figure 7.2.1) out of its Sabre computer reservations system (CRS I in figure 1). Travel agents whose agency used Sabre could no longer book flights on Braniff. Passengers were not harmed; they got seats on American. Agencies were not harmed; they still got to book flights for their customers and they still received their commissions. This was, however, disastrous for Braniff. Braniff's loss of traffic from agencies that used only Sabre was sufficient to bankrupt them. Note that most agencies "single homed"; that is, most agencies used either Sabre or Apollo but not both.

United Airlines also dropped Frontier (Airline B in figure 1) out of its Apollo reservations system (CRS II in figure 1). Now travel agents whose agency used only Apollo could not book flights on Frontier. The loss of traffic from agencies that used only Apollo was also sufficient to

bankrupt Frontier.

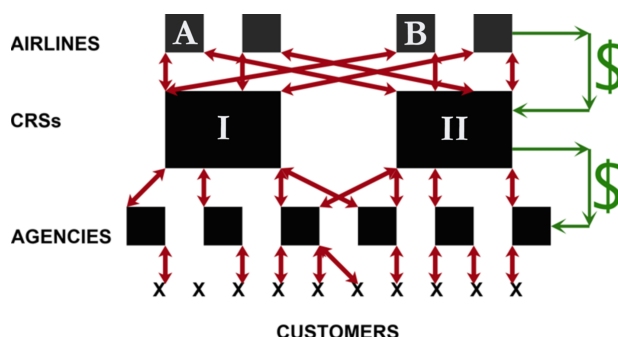


Figure 1.—Two computerized travel agent reservations systems, I and II, provide services to numerous airlines and to numerous travel agencies. Most agencies used only one system, so most airlines needed to work with both reservations systems.

The reservations systems operators learned an interesting lesson about the power of controlling an airline's interaction with potential passengers, and they began charging airlines for inclusion in their reservations systems. Airlines had already learned the same lesson, and they paid whatever fees the reservation systems demanded.

This was the start of a reverse price war, perhaps the first reverse price war in history. American Airlines introduced a fee of \$10 per reservation made through Sabre, and the money collected was available to provide subsidies to travel agencies to buy their loyalty and increase Sabre's market share; increased loyalty and increased market share among travel agencies would increase Sabre's bargaining power with airlines when it demanded higher fees from airlines.

United saw American's fees, and realized that it would also need to charge a fee for listings, to increase the loyalty of its own agencies and to increase its own bargaining power when demanding fees from airlines. United executives wanted to avoid the appearance of duopoly collusion and price fixing, and decided to charge a different price. The higher fee did not discourage airlines, which knew that they needed to be listed in both systems, and they did not discourage travel agencies, since agencies were not the ones being charged.

Since United's Apollo was charging the airlines more than American's Sabre, United would have more money to use to buy the continued loyalty of the agencies that used Apollo. American therefore added a fee for issuing paper tickets after the reservations had been made on Sabre; airlines had to pay a fee to Sabre every time an agency made a reservation and every time an

agency issued a ticket for one of the airline's flights. United now in turn was concerned that American's Sabre might have more money to use to buy the loyalty of the agencies that used Sabre than United had to buy the loyalty of users Apollo, which would have placed Apollo at a disadvantage. United responded by adding a fee for writing tickets and an additional fee for reservations with multiple segments.

This reverse price war was possible only because airlines had to be listed in both systems, because most agencies used only one of the two major CRSs. Airlines had to participate in both CRSs, which essentially eliminated competition between the systems. Interestingly, prices airlines paid for participation in Sabre and Apollo did not increase *despite* competition; prices increased *because* of competition.

This is our first example of a Mandatory Participation Third Party Payer System (MP3PP), functioning as an online gateway providing sellers access to their customers. These are mandatory participation systems because sellers have to be listed in both systems. They are third party payer systems, because it is the seller, not the user searching for the seller, who pays the fee. This combination means that competition does not lower prices charged by the system operators, and indeed, competition can actually cause platform operators to increase prices. More detailed treatment, and additional examples of reverses price wars in MP3PPs can be found in Clemons (2018, 2011b, 2011a).

## **6. The Most Severe Regulatory Conundrums We Face Today**

### **6.1. Harmful and Addictive Products in the Digital Economy**

There is increasing evidence that online social networks are addictive to a wide range of users (Hou, Xiong, Jiang, Song, & Wang, 2019). There is increasing evidence that online social networks are harmful to teens' self-image and self-perception, leading to depression and suicide (Keles, McCrae, & Grealish, 2020). Online social networks can be used for harmful purposes as varied as online bullying of students, organization of massacres in Myanmar (Fink, 2018), and recruitment for extremist groups both by Islamic jihadists (Ibrahim, Aris, & Razak, 2017) and American white supremacists (Shuster & Perrigo, 2021). Fake news is particularly pernicious both because it is designed to be rewarding and in some sense addictive to its audience (Johnson, 2018), and because it can be used to interfere with democratic practices that require an informed

electorate (Cadwalladr, 2017; Cadwalladr & Graham-Harrison, 2018; Allcott & Gentzkow, 2017). These problems do not fall within the Food and Drug Administration's mandate to limit harmful and addictive food and pharmaceutical products, nor at present do they appear to be governed by the rules that are intended to control the harmful behavior of publishing and media companies. Regulators are tempted to restrain social media companies through the application of antimonopoly law, but this is unlikely to be effective. Tobacco is addictive, and leaded gasoline was harmful to the environment, but neither tobacco companies nor Big Oil functioned as monopolies. Technology has given us a changed world, and regulation has yet to adapt. Regulators will need to protect users from unsafe and addictive online products, perhaps using consumer safety regulations for food and drugs, and perhaps using the restrictions on unsafe public meeting spaces, for guidance.

## **6.2. Misleading and Manipulative Advertising in the Digital Economy**

Google's reporting of search results has produced numerous complaints. The use of "Sponsored" to describe paid search results was considered misleading, and paid search results are now clearly labeled as ads. Google's allowing a company to purchase the use of a competitor's name as a search term might appear to violate trademark restrictions (Keating, 2007), but so far Google has argued successfully that since they are not actually selling a product they are not abusing trademark law and has settled any cases that might have set a damaging precedent against them (Rosencrance, 2008; see for instance, "Joined cases C-236/08 to C-238/08, Google France and Google," 2010). Even Google's ordering of search results has been attacked as misleading and not optimal for consumers, and Google has successfully argued that they are a publishing company and not a retailer, and that their search results ordering represents editorial content protected by the First Amendment's guarantee of freedom of speech (Gibbs, 2014).

Clearly Google does have the power to manipulate search results and thus to manipulate consumers. Although there have been numerous claims that consumers are misled, and there is little doubt that consumers can be misled, it is difficult to establish the extent to which consumers are currently being harmed. Google's ranking for paid search results, called rank by relevance by Google and rank by revenue by Dellarocas and Viswanathan (2008), tries to place the highest quality results at the top of paid search results because this results in more clicks and more ad

revenue for Google. It is theoretically possible for a demonstrably inferior seller to bid enough to achieve high ranking, and we know that this has occurred in the past; see, for example, the history of Google's support for the illegal importation of counterfeit pharmaceuticals from India and China, via Canadian websites (The U.S. Department of Justice, 2011). We have no evidence that harmful sellers are currently receiving support and assistance from Google, or even that they are still successfully bidding their way onto top results in sponsored search.

It is clear that online platforms, including both Google search and individual sellers' recommender systems, have the ability to manipulate consumers in ways that were not anticipated by the Federal Trade Commission or Trademark acts as they exist in numerous jurisdictions, so in that sense once again technology has created potential abuses not covered by existing regulations. Without a more clear demonstration of consumer harm, it is not possible for us to recommend more than increased scrutiny of the presentation of search results and recommendations to ensure that consumers are able to make informed decisions.

### **6.3. Participation Externalities, Network Effects, and Natural Monopolies**

We have known for decades that the breadth of coverage and scope of a market's offerings can provide a source of competitive advantage. When BZW's TRADE provided access to the widest range of equities of any online trading system in London it dominated online securities trading and had the largest share of the online market, and when Smith New Court's system began to offer broader equities coverage than BZW's TRADE lost its dominant position (Clemons & Row, 1991). Providing access to as much of the market as possible provides convenience, including the ability to construct a complete portfolio of trades, and this is a source of great competitive advantage.

Amazon dominates ecommerce in the US, with market share estimates that range from 40% to over 55% (PYMNTS, 2022). Alibaba global sales are even larger, in part because of the size of the Chinese market (Anthony, 2022). Regulators should not want to limit Amazon's breadth of product offerings, which include over 12 million products from Amazon itself and close to 350 million products when the Amazon Marketplace is included (Dayton, 2019). Consumers love the convenience. However, just as regulators need to consider the risks that platform envelopment creates for consumers, simply as a result of how attractive consumers find platforms' super-

additive value creation, regulators do need to consider the risks created by such powerful retail platforms.

Antimonopoly law in the US and elsewhere was created to deal with abuses of giant manufacturing firms, energy producers, transportation companies, and telecommunications providers (McCraw, 2009); antimonopoly law did not envision the emergence of dominant retailers. There have been numerous allegations that Amazon abuses its power. Complaints include Amazon's ability to force concessions from book publishers (Milliot, 2018). Amazon has been accused of promoting its own products above more highly ranked products from other providers (Jeffries & Yin, 2021). Amazon has likewise been accused of carefully monitoring the sales of products in the Amazon Marketplace and using sales information to determine when Amazon should *internalize* the offering and sell the product directly, bypassing the Marketplace seller (Zhu & Liu, 2018). Not all of these represent harm to consumers, and yet all increase Amazon's profitability and power, which complicates regulation. In particular, when Amazon internalizes a product offered by a seller in the Amazon Marketplace, consumers often get a lower price, and Prime Members receive free shipping, both of which are clearly beneficial to consumers.

How much power should online retailers be allowed to have, and what share of the market constitutes rebuttable presumption of monopoly power in retailing? Should Amazon be considered an essential facility (The U.S. Department of Justice, 2008; Patterson, Pitofsky, & Hooks, 2002; Albors-Llorens, 1999) and does it have a duty to provide Marketplace sellers fairly priced access to its customers? This is analysis complicated by the fact that the essential facilities doctrine itself is controversial, but appears to be becoming more important as online platforms, online gateways, and digital assistants emerge as critical facilities needed to access customers. Does Amazon have the right to alter the special status of Marketplace sellers after datamining the sellers' success? Does it have the right to engage in vertical integration and sell its own Amazon Basics products in competition with offerings from other sources? Once again, technology has dramatically changed as aspect of business, moving beyond what was envisioned when regulations were drafted to limit market power of dominant companies. Once again, we need to consider updating regulations. It's difficult for us to provide recommendations for regulators, because we do not yet fully understand which of Amazon's practices actually harm consumers.



#### **6.4. Platform Envelopment as an Increasingly Important Form of Monopoly Power in the Digital Economy**

Platform envelopment is emerging as perhaps the most important and least understood form of monopoly power in the digital economy. Their power comes from super-additive value creation, which makes them attractive to consumers who use them and to regulators who seek to control them. This power is easy to abuse. The Android operating system is “open,” in the sense that any mobile phone operator can use it without payment to Android or to Alphabet, but use of Android comes with hundreds of restrictions, as listed in the Mobile Application Distribution Agreement (MADA) (Nelson, 2014; Google, 2022). This agreement lists hundreds of restrictions, including which applications the manufacturer must pre-install on every Android device, which applications must be pre-installed on the home page or landing screen of every Android device, and as importantly, which applications may not be pre-installed. Not surprisingly, applications that Alphabet considers essential to its ability to learn about a customer, like Search and Gmail, must be pre-installed on the device’s home screen, and applications that compete with those that Alphabet considers essential cannot be pre-installed anywhere. The punishment for violating any of the restrictions is draconian; none of the offending manufacturers’ devices could access Google Play, meaning no applications could be downloaded, effectively destroying the value of the device as a smart phone (Edelman & Geradin, 2016).

Obviously this is an abuse of monopoly power, allowing Alphabet to use its dominance in smart phone operating systems to promote its own applications and services. However, just as obviously, this form of abuse was not considered in any previous forms of antimonopoly law. There are restrictions on what a customer can be forced to buy in order to have access to products they want. There are fewer restrictions on what customers can be given without charge. Android’s MADA has been ruled an abuse of monopoly power in the EU, resulting a fine of €4.34 billion (European Commission, 2018).

Once again, technology poses a new regulatory problem. Compelling platforms to permit all competitors’ offerings the same access to the core platform as platform operator’s own offerings is problematic in jurisdictions that do not acknowledge a duty to deal (Hovenkamp, 2021). That is, there is no universally acknowledged obligation for a company to provide services to its direc-

tor competitors. Once again, technology has altered our world, and regulations and legal codes have not yet adapted.

Moreover, platform envelopment does not have the appearance of more traditional monopolies. The presence of competing platforms, like Apple and Microsoft for music, or Apple's iOS and Google's Android for cellphones and tablets may present the appearance of competition, but these are in fact examples of parallel monopolies (Clemons, 2018, 2009) since without exception users have only one operating system on their devices. An e-book publisher has to work both with Apple and Amazon, just as the author of an app for smart phones has to deal with both Apple and Google. Our recommendation here is to consider greater reliance on the essential facilities doctrine (The U.S. Department of Justice, 2008; Patterson et al., 2002; Albers-Llorens, 1999), which would require platforms to deal with competitors on more equitable terms. In essence, this would limit platform operators' ability to restrict competitors' access to their platforms and would limit charges for access to levels that are considered "fair and equitable." This is problematic because the essential facilities doctrine has never been formally endorsed in the EU and has had only mixed success in the US Supreme Court and thus "duty to deal" with competitors is not universally accepted.

The most attractive and powerful platforms are evolving into online gateways that serve as our access to almost all online services. Google's smart Assistant and Amazon's Alexa can search for us, can play music for us, and can control our home appliances. Increasingly they serve as active life control interfaces (Clemons, Schreieck, Hermes, et al., 2022) and we use them to do our shopping. Not surprisingly, Google's Assistant increasingly directs purchases to sites that benefit Google and Alexa increasingly directs purchases to sites, like Whole Foods, that benefit Amazon (Valdez, 2018). Our recommendation here is to allow widespread cooperation among European companies in the widest range of industries, including cooperation among all participants in a single industry, in order to develop a European life control interface with access to a sufficiently wide range of goods and services. While this appears to be anticompetitive, and even appears to permit intra-industry collusion, it would actually improve competition. It would increase the number of viable EU-based life control interface platforms that are compliant with EU regulation from zero to one (Clemons, Schreieck, Hermes, et al., 2022).

## **6.5. Online Gateways, Mandatory Participation, and New Forms of Market Power in the Digital Economy**

We have wrestled with the problems caused by the power of search engines and of unrestricted online search quite literally for decades, having published our first paper on controlling the point of customer interaction in 1992 (Clemons & Kleindorfer, 1992). We continue to believe that the power of online search and online gateways represents one of the greatest current regulatory challenges of online commerce, because they are critical to all online commercial interactions, and because as mandatory participation third party payer systems their market power and ability to charge are not limited by competition (Clemons, 2011b, 2018, 2011a). Indeed, as we have seen, in such systems competition can actually cause a reverse price war, causing prices to increase rather than to decrease.

Google's online gateway model is in many ways similar to the online gateways represented by Sabre and Apollo, except of course that Google in some sense offers the market for everything, which is much larger than the market for air travel and hotels. Sabre and Apollo were regulated, in one of the rare applications of the essential facilities doctrine ("The Legal and Regulatory Implications of Airline Computer Reservation Systems," 1990; Locke, 1989). Since Sabre and Apollo were operated by airlines, it was clear that their discrimination against other airlines represented anticompetitive abuse of power; since Google's power is only infrequently used to discriminate against the offerings of other search engines on Google, as in the *Foundem* case (European Commission, 2017; Lomas, 2017), direct application of the essential facilities doctrine is less clear than it was in the case of Sabre and Apollo. Bracha and Pasquale have suggested something more direct, advocating the creation of a new Federal Search Commission to oversee search results listings and charges (Bracha & Pasquale, 2007). We might hope for a solution more like the Kingsbury Commitment, whereby Google agreed to some basic guidelines for its business practices and some limitations on its earnings, in exchange for freedom to manage its own business investments and strategy. As was the case with AT&T in 1913, Google / Alphabet knows far more about the successful operation of online businesses than the federal government does.

It is clear that once again technology has created business models that are poorly regulated by existing frameworks.

## **7. Conclusions**

### **7.1. Reasons for Optimism**

Societies and their regulators do now understand some elements of the problems posed by modern online platforms, which gives us some sense of optimism. The ways that online social networks exacerbate stresses within societies, and their contribution to intergroup hostility, were highlighted in the 2021 Nobel Peace Prizes, which went to journalists Maria Ressa and Dmitry Muratov. These journalists courageously defend freedom of express in oppressive totalitarian regimes (Nobel Prize Outreach AB, 2021). Ressa explicitly acknowledged the extent to which we are all — liberal or conservative, American or Filipino — being manipulated by distortion and misinformation on social media (Ressa, 2022). She did not go as far as we have when we called online social media a potential threat to the continued survival of human civilization (Clemons, Waran, et al., 2022). She does call misinformation, and Facebook explicitly, existential threats to democracy (Lema, 2021; Ressa, 2021). This visibility created by these prizes is increasing awareness of the dangers posed by misinformation and manipulation associated with online social media platforms, and may make regulation of these platforms more likely. Some regulators are taking slow steps to limit the harm Facebook can cause, especially after Facebook's coverage of a mass shooting in Christ Church New Zealand (Griffiths, 2019; Davis, 2019; UK Government, 2019).

The EU's competition commissioner Margrethe Vestager has demonstrated a firm understanding of the increasing importance of online gateways, even if she has not fully underscored their market power even when they do not enjoy monopolies. In the most recent of three antitrust rulings against Google, the European Commission fined Google €1.49 billion for its practices in search advertising brokering to cement its dominant market position (European Commission, 2019). In an earlier ruling, Google was fined €2.42 billion for abusing its dominant position in search to give illegal advantage to its own comparison shopping service. (European Commission, 2017).

Likewise, Commissioner Margrethe Vestager has demonstrated a firm understanding of the increasing importance of platform envelopment as a new form of monopoly power. This is displayed by the 2018 ruling in which Google was fined €4.34 billion for using the Android to further strengthen the dominance of its online search engine (European Commission, 2018)

## **7.2. Reasons for Pessimism**

One reason for pessimism comes from the fact that some platform companies have shown little or no willingness to change. The Bell System itself proposed the regulatory regime that ensured that America had the best national telephone network, including subsidies from businesses and urban communities to subsidize universal service in unprofitable rural areas and including caps on earnings and on profitability. It is difficult to imagine a regulatory regime proposed by either Google or Facebook that matches regulators' objectives so closely! For example, when Australia introduced legislation to crack down on violent content on social media platforms after the Christchurch massacre, Facebook, through the Digital Industry Group, heavily criticized the law for putting the responsibility for user content on Facebook (Karp, 2019). The whistleblower report by Frances Haugen on Facebook's practices shows a lack of interest in the harm it causes users, for example with regard to the effect of Instagram on the body image of young users (McNamee, 2021). Along that line, documents of the European Commission show how Facebook pushed back against any regulation being discussed by European authorities (Kayali, 2019). Similarly, Google threatened to withdraw its search engine from Australia in case a media law bill would be implemented that would require them to share royalties for news-related search results with news outlets (Boom, 2021). Google has been found guilty of violating the privacy of iPhone users in the US (Federal Trade Commission, 2012) with further actions pending both in the US (Stempel, 2020) and in the EU (Ng, 2018). These alleged abuses occurred while Google was still under the terms of a consent decree for prior privacy violations, which indicates just how difficult it has been to change the behavior of platform giants.

Online platform companies have unprecedented power and unprecedented ability to influence public opinion, which in turn gives them enormous impact over regulatory structures in markets like the US, where laws are drafted by elected officials. The example of the House's Stop Online Piracy Act (SOPA) (U.S. Congress, 2011b) and the Senate's companion Protect IP Act (PIPA)

(U.S. Congress, 2011a) is illustrative. Both bills initially enjoyed bipartisan support. Both bills faced waves of online attacks from Google, YouTube, Wikipedia, and other sites that benefited from unrestricted access to content that enjoyed protection under copyright (Rushe & Devereaux, 2012; Downes, 2012), including sites that went dark to demonstrate what government control and alleged censorship would do to the internet (Hsu & Chang, 2012). Both bills were defeated. Elected officials were unwilling to be seen as backing Hollywood or any other business interests in the face of such coordinated opposition. Although this has been described as “decentralized protest,” and as a spontaneous uprising (Hasa, 2012), the defeat of these bills was the result of a coordinated action by the companies that benefited most from lax enforcement of IP protections. As we described at the time (Clemons, 2012) and have written more recently (Clemons, Schrieck, & Teilmann-Lock, 2022), copyright law does need to adapt to the changing opportunities both for online theft and for creative reuse. Neither the US Congress nor the EU’s Digital Copyright Directive (European Parliament and of the Council, 2019) has done so.

Many of the abuses are not visible to consumers, or are not understood by consumers, or do not appear salient to consumers. In particular, the immediate benefits of platforms and super-additive value creation are visible to consumers and to regulators, while the future harm from lack of competition is both hypothetical and not yet visible to either. In the case of Google and Android, the superadditive value created by the operating system and its apps is immediately obvious; the harm created by the difficulty of new entrants succeeding with apps that do not data mine users is hypothetical and of little importance to consumers. Likewise, the value of the various elements of Microsoft Office seamlessly interacting with each other is obvious. In contrast, the harm created when Microsoft felt no pressure to resolve bugs in Word when it eliminated WordPerfect as a viable competitor is purely conjectural. We cannot know if Microsoft would have fixed bugs in footnotes and outlining faster if WordPerfect had continued to compete with Word.

Some jurisdictions are enforcing lax standards in their regulation of online platforms, undercutting other countries’ attempts at regulation and control. They are doing so for the immediate economic benefits available by hosting a large platform company, both as employers and as taxpayers in the local economy. The EU’s General Data Protection Regulation (GDPR) restricts processing of personal data, including by empowering data subjects through requirements of legitimacy and transparency (Trzaskowski, 2021a). Facebook uses data mining of personal infor-

mation to target stories to users most interested in them and users most responsive to them, which greatly facilitates the harmful impact from the dissemination of fake news (Edelson et al., 2021; Clemons, Waran, et al., 2022). Facebook argues that this data mining enhances their users' experience by providing them with contact they find most entertaining, and they argue that this data mining can be carried without the data subject's consent as they argue that the processing is necessary for the performance of the contract between Facebook and its users (Article 6(1)(b) GDPR). Ireland, where Facebook is headquartered in the EU, has permitted this data mining with contractual necessity as legitimate basis (Irish Data Protection Commission, 2021). Further litigation is expected as the draft decision allow for circumvention of the safeguards protected by both the GDPR and the EU Charter of Fundamental Rights (Trzaskowski, 2021b, pp. 58-59), but at present this example of lax national regulation for economic advantage remains.

The impact of the law and the punishment that are imposed on corporate violators may be too small to affect corporate behavior. Fines of 4% of global turnover may appear enormous in the context of manufacturing firms, but for firms with profit margins as high as those of platform operators, these fines amount to little more than licensing fees (Trzaskowski, 2021b, pp. 279-281; Gneezy & Rustichini, 2000; Schwartz & Sharpe, 2010, p. 91). And yet these fines, which can reach billions of dollars, are enormous compared to some fines that have been imposed previously. During the filming of Street View Google engaged in systematic and widespread tapping of unprotected local network traffic, including individuals' account identifiers and passwords for a range of online services (Kravets, 2012). They initially refused to cooperate with federal investigations and were charged with contempt of court in the US, for which a fine of \$25,000 was imposed. Ultimately, they paid a fine of \$13 million (Brittain, 2021); to assess this, it is useful to remember that Alphabet's 2021 gross revenues were exceeded \$257 billion (Lyons, 2022), which means that their fine for the Street View abuses represents 0.0051% of annual.

Not all fines appear inconsequential. In July 2019, the Federal Trade Commission imposed a \$5 billion penalty on Facebook for its violation of a 2012-settlement with the FTC (Federal Trade Commission, 2019). As we have noted above, the EU's Competition Commission imposed multiple fines of approximately the same size on Google. However, we need to consider whether even these fines will achieve their desired impact on the behavior of platform operators.

Penalties under EU law must be “effective, proportionate and dissuasive,” and when the GDPR was introduced a lot of attention was paid to the significant fines (up to €20,000,000, or up to 4% of the total worldwide annual turnover of the preceding financial year, whichever is higher) [Articles 83–84 GDPR]. A similar approach to penalties was recently introduced to EU consumer protection law [Directive (EU) 2019/2161 of 27 November 2019 (“New Consumer Deal”)]. It is not yet clear that penalties of 4% of revenue will be “effective, proportionate and dissuasive.”

During the peak of the industrial revolution in America, Cornelius (Commodore) Vanderbilt threatened two business associates with one of the shortest and least ambiguous business letters on record: “You have undertaken to cheat me. I won't sue you, for the law is too slow. I'll ruin you.” (Quote.org, 2022) It is not difficult to imagine a similar exchange between Google or Facebook and a regulator, with similar impact: “You have undertaken to restrain me. You can't sue me, for the law is too slow. And if you try, I'll ruin you.”

### **7.3. Directions for Future Research**

This last point in section 7.2 almost forces us to address the once-radical idea that global platform corporations will become the dominant mediators of human interaction and the dominant enforcers of the social contract. Where once the social contract was the informal agreement between the governed and those governed by the state, the social contract in the future might be seen as the agreement between consumers and the platforms with which they interact. The increasing role of commercial forces in governance of human affairs has been highlighted by the current conflict in Ukraine. Western responses to Russian aggression have included physical actions, including the provision of lethal defensive weapons like tank-destroying missiles and drone aircraft. This has made the invasion of Ukraine far less effective and far more costly for Russia, in terms of casualties and materiel. But in many ways the most effective responses have been economic. The West has imposed economic sanctions on Putin and his family, and more importantly on his most wealthy and powerful supporters. These sanctions make it impossible for oligarchs to leave Russia, to enjoy their European mansions and yachts, and impossible for them to access their massive offshore wealth; the wealthiest business leaders, and the most powerful military officers and government officials, are reduced to a life as Russian bureaucrats. Likewise, the west has imposed economic sanctions on Russia, blocking its access to its offshore wealth,



blocking its access to western technology that is essential for the functioning of its industry, blocking its access to western financial systems through SWIFT, and reducing its access to Western markets for the sale of its oil and natural gas. Russia will gain little from its invasion, and western powers never needed to deploy the military might of NATO.

In the West, after the 30 Years War ended with the Peace of Westphalia in 1648 the nation-state emerged as the dominant organizing structure in human society. In the post-Westphalian world, the nation-state was recognized as having the sole legitimate right to the use of violence and as having a monopoly on the deployment of new modes of armed force, as represented by both firearms and artillery (Kissinger, 2014). The nation-state emerged as dominant, replacing the role played by the church in previous centuries.

Perhaps the Online Platform Business will emerge as the dominant organizing structure in human society, based on its monopoly on the deployment of online information gathering and online customer surveillance and, more important, its monopoly on the deployment of information-based and targeted online information dissemination and influence. These platform companies control what we see when we search before we make purchases, and they are beginning to gain comparable levels of control over what many of us see when we search for news. The most powerful platform companies are merging online gateways with smart active life control interfaces (Clemons, Schrieck, Hermes, et al., 2022), and they will begin to influence what we do, just as completely as they influence what we see, what we buy and what we believe.

This might result in a new “Concert of Earth,” like the “Concert of Europe” that followed the Napoleonic Wars (Britannica, 2022b, 2022a). This was an informal agreement among the five dominant European powers, Austria, France, Prussia, Russia, and the United Kingdom, which attempted to provide a set of principles to ensure a stable balance of power among the changing alliances of European nations. This largely governed the behavior of states until the beginning of World War I. The United Nations sought to govern the behavior of nations and assure a peaceful world order after the devastation of the Second World War. Perhaps we will look to an informal alliance of global platform companies, with only limited allegiance to any nation-state, as the dominant actors in future forms of societal governance.

## References

- Albors-Llorens, A. (1999). The “Essential Facilities” Doctrine in EC Competition Law. *The Cambridge Law Journal*, 58(3), 490-492.
- Allcott, H., & Gentzkow, M. (2017). Social media and fake news in the 2016 election. *Journal of Economic Perspectives*, 31(2), 211-236.
- Anderson, P., & Tushman, M. L. (1991). Managing through cycles of technological change. *Research-Technology Management*, 34(3), 26-31.
- Anthony, J. (2022). 74 Amazon Statistics You Must Know: 2021/2022 Market Share Analysis & Data. Retrieved from <https://financesonline.com/amazon-statistics/>
- Blum, D. (2018). *The Poison Squad: One Chemist's Single-minded Crusade for Food Safety at the Turn of the Twentieth Century*: Penguin.
- Boom, D. V. (2021). Google's fight in Australia could change the future of media. *cnet*. Retrieved from <https://www.cnet.com/tech/tech-industry/googles-fight-in-australia-could-change-the-future-of-media/>
- Bracha, O., & Pasquale, F. (2007). Federal Search Commission-Access, Fairness, and Accountability in the Law of Search. *Cornell L. Rev.*, 93, 1149.
- Briggs, R. O., Nunamaker, J. F., & Sprague, R. H. (2007). Global perspectives on information, communication, and e-commerce. *Journal of Management Information Systems*, 23(4), 7-9.
- Britannica. (2022a). Concert of Europe. In *Britannica*.
- Britannica. (2022b). Congress of Vienna. In *Britannica*.
- Brittain, B. (2021). Google's settlement of Street View privacy case OK'd on appeal. *Reuters*. Retrieved from <https://www.reuters.com/legal/litigation/googles-settlement-street-view-privacy-case-okd-appeal-2021-12-27/>
- Cadwalladr, C. (2017). The great British Brexit robbery: how our democracy was hijacked. *The Guardian*. Retrieved from <https://www.theguardian.com/technology/2017/may/07/the-great-british-brexite-robbery-hijacked-democracy>
- Cadwalladr, C., & Graham-Harrison, E. (2018). Revealed: 50 million Facebook profiles harvested for Cambridge Analytica in major data breach *The Guardian*. Retrieved from <https://www.theguardian.com/news/2018/mar/17/cambridge-analytica-facebook-influence-us-election>
- Camerini, J. R. (2022). Alfred Russel Wallace. In *Britannica*.
- Christensen, C. M. (2011). *The Innovator's Dilemma: The Revolutionary Book That Will Change the Way You Do Business*. New York City: HarperBusiness.
- Clemons, E. K. (2009). What An Antitrust Case Against Google Might Look Like. Retrieved from <https://techcrunch.com/2009/03/01/what-an-antitrust-case-against-google-might-look-like/>
- Clemons, E. K. (2011a). Third Party Payer Systems: The Most Significant Regulatory Problem in the Online World? Retrieved from [https://www.huffpost.com/entry/post\\_2164\\_b\\_888842](https://www.huffpost.com/entry/post_2164_b_888842)
- Clemons, E. K. (2011b). Why Is There Still Litigation in Third Party Payer Distribution Systems in Air Travel. Retrieved from [https://www.huffpost.com/entry/why-is-there-still-litiga\\_b\\_887252](https://www.huffpost.com/entry/why-is-there-still-litiga_b_887252)
- Clemons, E. K. (2012). Reconsidering the Stop Online Piracy Act. Retrieved from [https://www.huffpost.com/entry/stop-online-piracy-act\\_b\\_1291942](https://www.huffpost.com/entry/stop-online-piracy-act_b_1291942)

- Clemons, E. K. (2018). *New Patterns of Power and Profit: A Strategist's Guide to Competitive Advantage in the Age of Digital Transformation*: Springer.
- Clemons, E. K., Croson, D. C., & Weber, B. W. (1996). *Market dominance as a precursor of market failure: emerging technologies and the competitive advantage of new entrants*. Paper presented at the Proceedings of HICSS-29: 29th Hawaii International Conference on System Sciences.
- Clemons, E. K., & Kleindorfer, P. R. (1992). An economic analysis of interorganizational information technology. *Decision Support Systems*, 8(5), 431-446.
- Clemons, E. K., Reddi, S. P., & Row, M. C. (1993). The impact of information technology on the organization of economic activity: The “move to the middle” hypothesis. *Journal of Management Information Systems*, 10(2), 9-35.
- Clemons, E. K., & Row, M. C. (1991). Sustaining IT advantage: The role of structural differences. *MIS Quarterly*, 15(3), 275-292.
- Clemons, E. K., & Row, M. C. (1998). *Electronic consumer interaction, technology-enabled encroachment, and channel power: the changing balance between manufacturers electronic distribution and established retailers*. Paper presented at the Proceedings of the Thirty-first Hawaii International Conference on System Sciences.
- Clemons, E. K., Schreieck, M., Hermes, S., Rowe, F., & Krcmar, H. (2022). The cooperation paradox. *Electronic Markets*, 32(2).
- Clemons, E. K., Schreieck, M., & Teilmann-Lock, S. (2022). *The Need to Revise Copyright Law to Reflect the Changing Costs and Benefits of Modern Digital Reuse of Artistic Creations*. Paper presented at the Proceedings of the 55th Hawaii International Conference on System Sciences.
- Clemons, E. K., Waran, R. V., Hermes, S., Schreieck, M., & Krcmar, H. (2022). Computing and Social Welfare. *Electronic Markets*. doi:10.1007/s12525-021-00512-0
- Copeland, D. G., & McKenney, J. L. (1988). Airline Reservations Systems: Lessons From History. *MIS Quarterly*, 12(3), 353-370.
- Darwin, C. (1872). *The Origin of Species by Means of Natural Selection, or the Preservation of Favoured Races in the Struggle for Life* (6th ed. ed.). London: John Murray.
- Davis, S. (2019). Regulating Beyond the Christchurch Call. Retrieved from <https://www.theregview.org/2019/12/31/davis-regulating-beyond-christchurch-call/>
- Dayton, E. (2019). Amazon Statistics You Should Know: Opportunities to Make the Most of America’s Top Online Marketplace. Retrieved from <https://www.bigcommerce.com/blog/amazon-statistics/#executive-summary-what-this-means-for-amazon-sellers>
- Dellarocas, C., & Viswanathan, S. (2008). *The holy grail of advertising? Allocative efficiency and revenue implications of “pay-per-action” advertising in environments with quality uncertainty*. Paper presented at the Proc. of 4th Workshop on Ad Auctions, Chicago, IL, USA.
- Desmond, A. J. (2022). The Beagle voyage of Charles Darwin. In *Britannica*.
- Dewan, R., Jing, B., & Seidmann, A. (2000). Adoption of Internet-based product customization and pricing strategies. *Journal of Management Information Systems*, 17(2), 9-28.
- Dewan, R., Jing, B., & Seidmann, A. (2003). Product customization and price competition on the internet. *Management science*, 49(8), 1055-1070.

- Downes, L. (2012). Who Really Stopped SOPA, and Why? *Forbes*. Retrieved from <https://www.forbes.com/sites/larrydownes/2012/01/25/who-really-stopped-sopa-and-why/?sh=e835a967b762>
- Edelman, B., & Geradin, D. (2016). Android and Competition Law: Exploring and Assessing Google's Practices in Mobile. *Harvard Business School Working Papers*(17-018).
- Edelson, L., Nguyen, M.-K., Goldstein, I., Goga, O., McCoy, D., & Lauinger, T. (2021). *Understanding engagement with US (mis) information news sources on Facebook*. Paper presented at the Proceedings of the 21st ACM Internet Measurement Conference.
- Eisenmann, T. R., Parker, G. G., & Alstyne, M. W. V. (2006). Strategies for Two-Sided Markets. *Harvard Business Review*, 84(10).
- Eisenmann, T. R., Parker, G. G., & Van Alstyne, M. (2011). Platform envelopment. *Strategic Management Journal*, 32(12), 1270-1285.
- European Commission. (2017). Antitrust: Commission fines Google €2.42 billion for abusing dominance as search engine by giving illegal advantage to own comparison shopping service. Retrieved from [http://europa.eu/rapid/press-release\\_IP-17-1784\\_en.htm](http://europa.eu/rapid/press-release_IP-17-1784_en.htm)
- European Commission. (2018). Antitrust: Commission fines Google €4.34 billion for illegal practices regarding Android mobile devices to strengthen dominance of Google's search engine. Retrieved from [http://europa.eu/rapid/press-release\\_IP-18-4581\\_en.htm](http://europa.eu/rapid/press-release_IP-18-4581_en.htm)
- European Commission. (2019). Statement by Commissioner Vestager on Commission decision to fine Google € 1.49 billion for abusive practices in online advertising. Retrieved from [https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT\\_19\\_1774](https://ec.europa.eu/commission/presscorner/detail/en/STATEMENT_19_1774)
- Directive (EU) 2019/790 of the European Parliament and of the Council of 17 April 2019 on copyright and related rights in the Digital Single Market and amending Directives 96/9/EC and 2001/29/EC, (2019).
- FDA. (2022). What We Do. Retrieved from <https://www.fda.gov/about-fda/what-we-do#mission>
- Federal Trade Commission. (2012). Google Will Pay \$22.5 Million to Settle FTC Charges it Misrepresented Privacy Assurances to Users of Apple's Safari Internet Browser [Press release]. Retrieved from <https://www.ftc.gov/news-events/news/press-releases/2012/08/google-will-pay-225-million-settle-ftc-charges-it-misrepresented-privacy-assurances-users-apples>
- Federal Trade Commission. (2022). Federal Trade Commission Act. Retrieved from <https://www.ftc.gov/legal-library/browse/statutes/federal-trade-commission-act>
- Fink, C. (2018). Dangerous speech, anti-Muslim violence, and Facebook in Myanmar. *Journal of International Affairs*, 71(1.5), 43-52.
- Forman, C., Ghose, A., & Wiesenfeld, B. (2008). Examining the relationship between reviews and sales: The role of reviewer identity disclosure in electronic markets. *Information systems research*, 19(3), 291-313.
- Fung, B. (2013). This 100-year-old deal birthed the modern phone system. And it's all about to end. *The Washington Post*. Retrieved from <https://www.washingtonpost.com/news/the-switch/wp/2013/12/19/this-100-year-old-deal-birthed-the-modern-phone-system-and-its-all-about-to-end/>
- Ghose, A., & Todri, V. (2016). Toward a digital attribution model: measuring the impact of display advertising on online consumer behavior. *MIS Quarterly*, 40(4), 889-910.

- Gibbs, S. (2014). Editing Google's search results would damage free speech, judge rules. *The Guardian*. Retrieved from <https://www.theguardian.com/technology/2014/nov/18/google-search-judge-free-speech>
- Gneezy, U., & Rustichini, A. (2000). A fine is a price. *The journal of legal studies*, 29(1), 1-17.
- Google. (2022). Google Play Developer API Terms of Service Retrieved from <https://developers.google.com/android-publisher/terms>
- Gould, S. J. (2007). *Punctuated Equilibrium*. Cambridge, Massachusetts: Belknap Press: An Imprint of Harvard University Press.
- The Government and the A. T. & T. Company. (1914). *Telephone Engineer*, 11(1), 13.
- Griffiths, J. (2019). Australia passes law to stop spread of violent content online after Christchurch massacre. *CNN*. Retrieved from <https://www.cnn.com/2019/04/04/australia/australia-violent-video-social-media-law-intl/index.html>
- Hamilton, W. F. (1986). Corporate strategies for managing emerging technologies. In *Technology in the modern corporation* (pp. 103-118): Elsevier.
- Hasa, J. (2012). SOPA/PIPA and the Decentralization of Protest. Retrieved from <https://createequity.com/2012/03/sopapipa-and-the-decentralization-of-protest/>
- Hayes, R. H., Wheelwright, S. C., & Clark, K. B. (1988). *Dynamic manufacturing: Creating the learning organization*. New York City: Simon and Schuster.
- Hein, A., Schreieck, M., Riasanow, T., Setzke, D. S., Wiese, M., Böhm, M., & Krcmar, H. (2020). Digital platform ecosystems. *Electronic Markets*, 30(1), 87-98.
- Henderson, R. (1993). Underinvestment and incompetence as responses to radical innovation: Evidence from the photolithographic alignment equipment industry. *The RAND Journal of Economics*, 248-270.
- Hou, Y., Xiong, D., Jiang, T., Song, L., & Wang, Q. (2019). Social media addiction: Its impact, mediation, and intervention. *Cyberpsychology: Journal of psychosocial research on cyberspace*, 13(1).
- Hovenkamp, E. (2021). The Antitrust Duty to Deal in the Age of Big Tech. *The Yale Law Journal*, 131(5), 1483-1558.
- Hsu, T., & Chang, A. (2012). Websites go dark to protest SOPA, PIPA bills. *Los Angeles Times*. Retrieved from <https://www.latimes.com/archives/la-xpm-2012-jan-18-la-fi-internet-strike-20120119-story.html>
- Ibrahim, N. H. B., Aris, S. R. S., & Razak, F. H. A. (2017). The Use of Facebook in ISIS Recruitment-An Exploratory Study. *Journal of Media and Information Warfare*, 10, 51-77.
- Draft Decision for the purposes of Article 60 GDPR of the Data Protection Commission made pursuant to  
Section 113(2)(a) of the Data Protection Act 2018 (2021).
- Jeffries, A., & Yin, L. (2021). Amazon Puts Its Own “Brands” First. *The Markup*. Retrieved from <https://themarkup.org/amazons-advantage/2021/10/14/amazon-puts-its-own-brands-first-above-better-rated-products>
- Johnson, J. (2018). The self-radicalization of white men: “Fake news” and the affective networking of paranoia. *Communication Culture & Critique*, 11(1), 100-115.
- Joined cases C-236/08 to C-238/08, Google France and Google, No. ECLI:EU:C:2010:159 (Court of Justice of the European Union 2010).



- Kalakota, R., & Whinston, A. B. (1996). *Frontiers of electronic commerce*: Addison Wesley Longman Publishing Co., Inc.
- Kalakota, R., & Whinston, A. B. (1997). *Electronic commerce: a manager's guide*: Addison-Wesley Professional.
- Karp, P. (2019). Australia passes social media law penalising platforms for violent content. *The Guardian*. Retrieved from <https://www.theguardian.com/media/2019/apr/04/australia-passes-social-media-law-penalising-platforms-for-violent-content>
- Kayali, L. (2019). Inside Facebook's fight against European regulation. *Politico*. Retrieved from <https://www.politico.eu/article/inside-story-facebook-fight-against-european-regulation/>
- Keating, G. (2007). American Airlines sues Google over search words. *Reuters*. Retrieved from <https://www.reuters.com/article/us-google-amr/american-airlines-sues-google-over-search-words-idUSN1725026420070817>
- Keles, B., McCrae, N., & Grealish, A. (2020). A systematic review: the influence of social media on depression, anxiety and psychological distress in adolescents. *International Journal of Adolescence and Youth*, 25(1), 79-93.
- Kravets, D. (2012). An Intentional Mistake: The Anatomy of Google's Wi-Fi Sniffing Debacle. Retrieved from <https://www.wired.com/2012/05/google-wifi-fcc-investigation/>
- Lamichhaney, S. (2022). Adaptive evolution in Darwin's Finches. *Harvard University Research*. Retrieved from <https://scholar.harvard.edu/sangeet/adaptive-evolution-darwins-finches>
- Lamichhaney, S., Han, F., Berglund, J., Wang, C., Almén, M. S., Webster, M. T., . . . Andersson, L. (2016). A beak size locus in Darwin's finches facilitated character displacement during a drought. *Science*, 352(6284), 470-474.
- The Legal and Regulatory Implications of Airline Computer Reservation Systems. (1990). *Harvard Law Review*, 103(8), 1930-1950.
- Lema, K. (2021). Philippine Nobel winner Ressa calls Facebook 'biased against facts'. *Reuters*. Retrieved from <https://www.reuters.com/world/philippine-nobel-winner-ressa-calls-facebook-biased-against-facts-2021-10-09/>
- Locke, L. G. (1989). Flying the unfriendly skies: The legal fallout over the use of computerized reservation systems as a competitive weapon in the airline industry. *Harvard Journal of Law & Technology*, 2, 219.
- Lomas, N. (2017). Google fined \$2.7BN for EU antitrust violations over shopping searches. Retrieved from [https://techcrunch.com/2017/06/27/google-fined-e2-42bn-for-eu-antitrust-violations-over-shopping-searches/?guccounter=1&guce\\_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guc e\\_referrer\\_sig=AQAAAG6CtU0uPW63lAkCuSlSHaDHLMG2TNG4SHh2Pjnkq8ukl7g w6poz-aINFCEzs7V\\_b-oJGOirEKXJy8NgebyvVjY1OFR6p7Mwwp\\_NwfQXvEVJqndRtc4vvCO6Z-XWSpMvR1KFL3dFk8mHxVLleTZRzyTDcJ1u8aM55OE\\_b7eXy-E](https://techcrunch.com/2017/06/27/google-fined-e2-42bn-for-eu-antitrust-violations-over-shopping-searches/?guccounter=1&guce_referrer=aHR0cHM6Ly93d3cuZ29vZ2xlLmNvbS8&guc e_referrer_sig=AQAAAG6CtU0uPW63lAkCuSlSHaDHLMG2TNG4SHh2Pjnkq8ukl7g w6poz-aINFCEzs7V_b-oJGOirEKXJy8NgebyvVjY1OFR6p7Mwwp_NwfQXvEVJqndRtc4vvCO6Z-XWSpMvR1KFL3dFk8mHxVLleTZRzyTDcJ1u8aM55OE_b7eXy-E)
- Lyons, K. (2022). Google parent company Alphabet broke \$200 billion in annual revenue for the first time. Retrieved from <https://www.theverge.com/2022/2/1/22912196/google-alphabet-200-billion-annual-revenue-youtube-pixel-search>
- McAfee, A., & Brynjolfsson, E. (2017). *Machine Platform Crowd – Harnessing Our Digital Future*. New York: W. W. Norton & Company.
- McCraw, T. K. (2009). *Prophets of regulation*: Harvard University Press.
- McGuire, R. A. (1981). *Economic Causes of Late-Nineteenth Century Agrarian Unrest*: New

- Evidence. *The Journal of Economic History*, 41(4), 835-852.
- McNamee, R. (2021). Facebook Will Not Fix Itself. *Time*. Retrieved from <https://time.com/6104863/facebook-regulation-roger-mcnamee/>
- Milliot, J. (2018). Publishing Leaders Issuing Warning over Amazon's Market Power. *Publishers Weekly*. Retrieved from <https://www.publishersweekly.com/pw/by-topic/industry-news/bookselling/article/84119-publishing-leaders-issuing-warning-over-amazon-s-market-power.html>
- Nelson, R. (2014). Google's MADA defines rules for Android device makers. Retrieved from <https://androidcommunity.com/googles-mada-defines-rules-for-android-device-makers-20140505/>
- New York Times. (2012). May 15, 1911 | Supreme Court Orders Standard Oil to Be Broken Up. *The Learning Network*. Retrieved from <https://learning.blogs.nytimes.com/2012/05/15/may-15-1911-supreme-court-orders-standard-oil-to-be-broken-up/>
- Ng, A. (2018). Google stands to lose up to \$4.3 billion in UK privacy suit. Retrieved from <https://www.cnet.com/news/privacy/google-sued-by-uk-privacy-group-representing-4-4-million-iphone-users/>
- NIDA. (2012). Coca-Cola's Scandalous Past. Retrieved from <https://archives.drugabuse.gov/blog/post/coca-colas-scandalous-past>
- Nobel Prize Outreach AB. (2021). The Nobel Peace Prize 2021. Retrieved from <https://www.nobelprize.org/prizes/peace/2021/press-release/>
- Nottorf, F., & Funk, B. (2013). A cross-industry analysis of the spillover effect in paid search advertising. *Electronic Markets*, 23(3), 205-216.
- Oestreicher-Singer, G., & Sundararajan, A. (2012). Recommendation networks and the long tail of electronic commerce. *MIS Quarterly*, 65-83.
- Parker, G. G., Van Alstyne, M. W., & Choudary, S. P. (2016). *Platform Revolution*. New York: W. W. Norton & Company.
- Patterson, D., Pitofsky, R., & Hooks, J. (2002). The Essential Facilities Doctrine Under United States Antitrust Law. *Antitrust Law Journal*, 70, 443-462.
- Planet Retro. (2018). Coca-Cola: The Pause that Refreshes. Retrieved from <https://blog.retroplanet.com/coca-cola-pause-refreshes/>
- PYMNTS. (2022). Amazon's Share of US eCommerce Sales Hits All-Time High of 56.7% in 2021. Retrieved from <https://www.pymnts.com/news/retail/2022/amazons-share-of-us-e-commerce-sales-hits-all-time-high-of-56-7-in-2021/>
- Quote.org. (2022). Retrieved from <https://quote.org/quote/gentlemen-you-have-undertaken-to-cheat-me-625979>
- Ressa, M. (2021). Disinformation on Social Media Is Threat to Democracy.
- Ressa, M. (2022). We're All Being Manipulated the Same Way. *The Atlantic*. Retrieved from <https://www.theatlantic.com/ideas/archive/2022/04/maria-ressa-disinformation-manipulation/629483/>
- Rosencrance, L. (2008). American Airlines drops trademark lawsuit against Google. *Computerworld*. Retrieved from <https://www.computerworld.com/article/2535000/american-airlines-drops-trademark-lawsuit-against-google.html>
- Rushe, D., & Devereaux, R. (2012). Sopa support drops off as blackout protest rattles the

- internet. *The Guardian*. Retrieved from <https://www.theguardian.com/technology/2012/jan/18/sopa-wikipedia-blackout-google-reddit>
- Schreieck, M., Wiesche, M., & Krcmar, H. (2021). Capabilities for value co-creation and value capture in emergent platform ecosystems: A longitudinal case study of SAP's cloud platform. *Journal of Information Technology*, 36(4), 365-390.
- Schumpeter, J. A. (1994 [1942]). *Capitalism, Socialism and Democracy*. London: Routledge.
- Schwartz, B., & Sharpe, K. (2010). *Practical wisdom: The right way to do the right thing*: Penguin.
- Shiller, B. R. (2020). Approximating purchase propensities and reservation prices from broad consumer tracking. *International Economic Review*, 61(2), 847-870.
- Shuster, S., & Perrigo, B. (2021). Like, Share, Recruit: How a White-Supremacist Militia Uses Facebook to Radicalize and Train New Members. *Time*. Retrieved from <https://time.com/5926750/azov-far-right-movement-facebook/>
- Sinclair, U. (1906). *The Jungle*: Doubleday, Page & Co.
- Stempel, J. (2020). Google faces \$5 billion lawsuit in U.S. for tracking 'private' internet use. Retrieved from <https://www.reuters.com/article/us-alphabet-google-privacy-lawsuit-idUSKBN23933H>
- Competition and Monopoly: Single-Firm Conduct under Section 2 of the Sherman Act, (2008). The U.S. Department of Justice. (2011). Google Forfeits \$500 Million Generated by Online Ads & Prescription Drug Sales by Canadian Online Pharmacies [Press release]. Retrieved from <https://www.justice.gov/opa/pr/google-forfeits-500-million-generated-online-ads-prescription-drug-sales-canadian-online>
- Trzaskowski, J. (2021a). GDPR Compliant Processing of Big Data in Small Business. In C. L. Pedersen, A. Lindgreen, T. Ritter, & T. Ringberg (Eds.), *Big Data in Small Business—Data-Driven Growth in Small and Medium-Sized Enterprises*: Edward Elgar.
- Trzaskowski, J. (2021b). *Your Privacy Is Important to Us! – Restoring Human Dignity in Data-Driven Marketing*: Ex Tuto.
- Trzaskowski, J. (2022). Data-driven value extraction and human well-being under EU law. *Electronic Markets*, forthcoming, 1-12.
- Tushman, M. L., & Anderson, P. (1986). Technological discontinuities and organizational environments. *Administrative science quarterly*, 439-465.
- Tushman, M. L., & Romanelli, E. (1985). Organizational evolution: A metamorphosis model of convergence and reorientation. *Research in organizational behavior*.
- Protect IP Act, (2011a).
- Stop Online Piracy Act, (2011b).
- UK Government. (2019). *Online Harms - White Paper*. Retrieved from [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/973939/Online\\_Harms\\_White\\_Paper\\_V2.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/973939/Online_Harms_White_Paper_V2.pdf)
- Valdez, J. (2018). How Amazon's Alexa Chooses Which Products To Buy. Retrieved from <https://amzadvisers.com/amazons-alexa-chooses-products-buy/>
- Zhou, Z., & Van Alstyne, M. (2019). *Platform Valuation and Network Effects*. Paper presented at the Platform Strategy Research Symposium.
- Zhu, F., & Liu, Q. (2018). Competing with complementors: An empirical look at Amazon. com. *Strategic Management Journal*, 39(10), 2618-2642.