Fail Fast: The Value of Studying Unsuccessful Technology Companies[1]

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Abstract:

"Fail fast, fail often" is the unofficial mantra of Silicon Valley. It reflects the ethos of the contemporary technology industry that encourages an unwavering focus on staying ahead of the curve and discovering the next big thing. This forward-looking approach can lead to industrial amnesia—a collective forgetting on the part of the technology industry about past projects and failed initiatives. In this article, I draw on a research from a larger project on the history of the consumer privacy industry to advocate for the importance of studying failed companies and industries. I argue media industries research should resist the seductive pull of the popular or new that prevails in Silicon Valley to occasionally focus on those companies that have not achieved commercial success. Through a case study that examines the rise, decline, and reemergence of the infomediary model, this article considers the possible interventions available to media industries research when it attends to industrial failure.

Keywords: Internet, Identity, Research Methods, Technology

Caricatures of the technology industry, epitomized by the culture and landscape of Silicon Valley, often identify "fail fast, fail often" as the guiding ethos of this community. The attitude signaled in this phrase celebrates success through innovation while fetishizing risk as a necessary component of achievement. Although risky ventures have a low rate of success, they reflect the innovative potential that helps insulate entrepreneurs against stale products. Proponents of this perspective regularly refer to familiar technological and creative figures as icons of failure.[2] They cite Thomas Edison, Henry Ford, and Steve Jobs: entrepreneurs whose most lucrative inventions came only after unsuccessful ventures. They also point to comedians such as Jerry Seinfeld and Chris Rock who test their material in small venues, ruthlessly cutting the jokes that do not land, before moving to a bigger stage. This celebration of failure as an essential component of the cycle of innovation is reflected in the mythology of the American entrepreneurial spirit. As an article in *The Economist* notes, "in Germany bankruptcy can end your business career whereas in Silicon Valley it is almost a badge of honour."[3] The American entrepreneurial class, this perspective suggests, benefits from the country's forgiving attitude toward failure.

Although the "fail fast" mentality is commonly associated with the industrial culture of Silicon Valley, the term does not emanate from this community. Jack V. Matson, an environmental engineering professor at Pennsylvania State University, first introduced the phrase "intelligent fast failure" in 1989.[4] In a 1991 book titled *The Art of Innovation: Using Intelligent Fast Failure*, Matson defines the term:

> "Intelligent" means that when you take a risk you want to learn as much as possible about what happened and why by gathering feedback. "Intelligent" also means the risk is attempted in such a way that not many resources (time and money) are lost if it fails. "Fast" means that risk is accelerated so that you know what happened quickly. "Failure" means that you should not expect most plans to work out. Most will, in fact, fail; but it is through the process of failure that you acquire the knowledge of the partial truths which will enable you to develop successful risks.[5]

The chances for success, Matson notes, are increased when failure is recognized as an opportunity for learning and growth. "The hallmark of productive failure," he writes, "is the use of intelligence to optimize the yield of partial truths. Each attempt must be thoughtfully planned, executed, and reviewed so that intelligent failure becomes productive failure."[6] The "fast failure" concept has an implicit relationship to "sunk cost" theory: the behavioral economic principle that argues people are likely to continue an endeavor once they have invested resources—time, money, or effort—into it.[7] Similar to the logic of "failing fast," sunk cost theory argues it is better to abandon doomed projects quickly, capitalizing on the knowledge and connections gained along the way, rather than devoting resources to a lost cause.

Despite this supposedly permissive stance on unsuccessful commercial projects, those who study new media industries tend not to invest time reflecting on these failed products and companies. A consequence of the "fail fast" mentality, particularly among those working in the fields of emergent technology, is an industry-wide amnesia about unsuccessful projects. Although entrepreneurs may get credit for innovative but ultimately unsuccessful ventures,[8] these projects are often painted as necessary steps on the path to innovation, rather than as important or meaningful accomplishments in and of themselves. As business historian Kenneth Lipartito writes, treatment of failure as part of an evolutionary framework for technology "makes failures into preludes for improvement and progress."[9] The result is that unsuccessful initiatives can fade in the industry's collective memory, replaced instead by stories of successful start-ups that revolutionized thinking or disrupted an existing industry. When failed companies *are* examined, for example, in business schools and management texts, these case studies often exist as cautionary tales about the consequences of poor decision making or leadership.[10] The products or services themselves are obscured by a focus on strategic lessons.

Tech entrepreneurs and media industry researchers can both face pressures to keep up with the newest digital trends. In the case of new media scholars, this has the potential to encourage research that focuses on successful or influential companies. Steven Jackson observes several reasons for this focus, including a general preference for "the new" and a dismissal of technologies that are *passé*.[11] Moreover, companies that are popular or economically successful are more likely to have a direct and visible effect on the social and political landscape than those commercially unsuccessful ventures that fade into obscurity. This focus on economic success, however, obscures the important stories that can be told by companies—or entire industries—that have failed.

The consumer privacy industry offers one such illustration. In the 1990s, as access to digital tools expanded to include populations not well versed in computer science and coding, an industry emerged to provide consumers with a set of tools to manage and protect their digital information. This industry offered a range of privacy-enhancing technologies.[12] One set of tools was provided by a group of companies referred to collectively as *infomediaries*. The entrepreneurs behind these tools were invested in a particular model of privacy that promoted the collection and exchange of personal information for economic reward while maintaining the architectural features of an anonymous web. Although these start-ups folded in a matter of years, contemporary entrepreneurs have shown a renewed interest in the infomediary vision. In recent years, a number of companies have reintroduced this model as a strategy for supporting personal information control in the digital era.

Elsewhere, I provide a detailed account of the cycles of the consumer privacy industry as a whole that examines the industry's role in shaping the cultures and political economies of digital data and online privacy.[13] Such an account is not possible here; however, an examination of the trajectory of the infomediary model offers a clear case for the value of examining commercially unsuccessful projects as part of a digital media industry research agenda. Juxtaposing the ideologies behind the products offered during the first and second generations of this industry allows for a careful look at evolving attitudes toward privacy. By holding these two sets of companies side-by-side, we can see the shifts in the political, cultural, and economic climate surrounding, in this case, investments in online privacy. Moreover, imagining the alternative reality that might have resulted from the success of a failed product or industry forces us to dislodge assumptions about the inevitability of our current technological environment.[14]

Beyond Web History: The Value of Studying Industrial Failure

Web historiographer Niels Brügger notes that history has not played a significant role in the first two decades of internet research.[15] New fields of study, he explains, rarely experience an urgent need to establish a research agenda that concerns the past. Moreover, he observes, some may feel the relatively short life of the web makes it an ill-suited site for historical work. Brügger argues, however, that it is time for history to take a more prominent place in the newly established field of Internet Studies. He writes,

> [A] better understanding of the web of the past is an essential condition for gaining a more complete understanding of the web of today, regardless of whether our focus is on political economy, language and culture, social interaction or everyday use.[16]

The analysis of the web in its historical context is not a new academic pursuit. In *Always Already New*, Lisa Gitelman examines how, through its evolution, the web is simultaneously constructing its own narrative of development and resisting traditional ways of "doing" history.[17] Despite a unique set of challenges faced by researchers interested in this distributed and ephemeral medium,[18] efforts at web historiography represent a promising effort to combat what internet pioneer Stuart Brand has referred to as civilization's amnesia around the digital past[19]—a consequence of the rapid information turnover and a failure to make systematic efforts to record the web.[20] This important work continues previous efforts to record and analyze the web's cultural, technical, institutional, and political development.[21]

It is, however, essential that we do more than simply record and reflect on the digital past. Efforts to historicize digital culture must also focus on the paths not taken—the failed cultural and industrial projects that are too often relegated to our virtual trash bins.[22] In an essay advocating for research using "broken world thinking," Jackson argues moments of rupture—breakdown, maintenance, and repair—represent an understudied site of inquiry in media research. Although part of the routine life cycle of technological products, Jackson argues we tend to ignore errors, focusing instead on functioning systems.[23] Without fetishizing the past, Jackson writes, we need to move beyond a myopic focus on production and design to examine the full range of the technological life cycle.

Across disciplines, there are calls to reign in our tendency to study the popular, the successful, and the powerful. Studies of failure sit comfortably within both critical cultural studies and media industry research. Throughout his career, the critical cultural theorist Stuart Hall focused on finding meaning in popular culture. His interest in these texts, however, did not stem from their popularity per se. Rather it came from their position as sites of cultural struggle—as contested texts.[24] We can read failed industry projects as similarly contested sites. Rather than viewing failure as an inevitable outcome of poor production or a lack of market insight, studies of unsuccessful products and industries can provide understanding into the particular social, political, and economic conditions that made a project commercially untenable.

There is a tradition in fields close to media industry studies of investigating failure. In his 2004 address to the Business History Conference, Association President Patrick Fridenson observed that just as the historian learns to avoid hagiography, an undue emphasis on history's winners, so too must the historian of business avoid an agenda that focuses exclusively on the successful and powerful.[25] Echoing these sentiments, Lipartito cautions against the unreflexive deployment of the terms *success* and *failure*, themselves constructs that do not capture the complex life cycle of a product.[26] Product failures, Lipartito notes, are not necessarily predetermined by poor hardware design nor can their rejection be automatically attributed to a purposeful consumer agenda. Instead, he argues, we need to examine products in terms of the social conditions that produce their success or failure. Moreover, he suggests, there is value in imagining the legacies of so-called failed technologies on the evolution of the technical systems in which they reside.[27]

Media archaeology has made failure an explicit focus of its theoretical inquiry. Jussi Parikka describes this style of inquiry as "interested in excavating the past in order to understand the present and the future."[28] As both a methodological and theoretical approach, Parikka writes that media archaeology offers "a way to investigate the new media cultures through insights from past new media, often with an emphasis on the forgotten, the quirky, the non-obvious apparatuses, practices and inventions."[29] Parikka notes this approach can be applied to a number of different areas including computing cultures and countercultures, labor and work configurations, and, most importantly here, the institutionalization and commodification of technology.[30]

One example of the application of this approach to media institutions and infrastructures is found in Lisa Parks and Nicole Staroseilski's edited collection *Signal Traffic*.[31] The authors in this volume examine the influences of distribution, materiality, and technical literacies on media cultures. Echoing Jackson's assertion that media infrastructures tend to remain

invisible until they break,[32] contributing authors to *Signal Traffic* examine how the physical and discursive infrastructures that support new media technologies define the choices offered to consumers. Scholars of media policy take a similar approach when they study the sociopolitical contexts and subsequent consequences of failed political interventions. Victor Pickard's work, for example, examines the unsuccessful interventions proposed by the media reform movements of the 1940s.[33] Despite the productive discursive role played by these actors in shaping the arguments available to future media reformers, Pickard notes that the failure of media reform movements in the mid-twentieth century allowed business interests to argue successfully against regulatory intervention. As a result, the failure of one set of policy interests paved the way for the eventual success of another.

Although not explicitly about failure, Megan Ankerson's research on the history of web aesthetics and design provides an essential contribution to understanding the interplay between industrial practices and digital culture. Ankerson describes the importance of interrogating the phases of web development that have metastasized as commonsense signposts in the medium's evolution. Rather than viewing the static aesthetic of Web 1.0 as a necessary but underdeveloped precursor to the vibrancy and interactivity of Web 2.0, Ankerson asserts a need to explore the early internet on its own terms, acknowledging the economic pressures and social contexts that contributed to its particular patterns of development and design. This approach allows Ankerson to

> examine the dot-com era not as a lapse of corporate rationality or a beta version of the better web to come but as a significant moment of cultural production where creative teams, corporate ties, and changing organizational structures interact to product the "look and feel" of the web.[34]

Media industry scholars have also explored the cultural consequences for the technology industry resulting from its ambivalent relationship to failure. In her work *Venture Labor*, Gina Neff describes risk as a central feature of the technology industry where failure is built into corporate strategy. Neff argues the consequences of failure resulting from risky endeavors have differential effects throughout the industry. While innovative but ultimately unsuccessful projects may serve as a mark of prestige for those in the entrepreneurial class, the penalties for working on failed projects can be acute for precarious laborers who assume corporate risk without enjoying the reputational security that shields their employers.[35] In this tenuous labor environment, Neff notes, technology workers construct a strategic professional identity as a tactic for mitigating risk. Similarly, Alice Marwick argues the neoliberal ideology that shapes the contemporary technology industry allows risk-taking to be viewed as a necessary component of entrepreneurial success.[36]

Both the business literature on failure and the critical research on entrepreneurial cultures of risk focus on consequences at the individual or company level. As a result, they tend to emphasize the effects of risk on a single entrepreneur or business. Productive failure occurs when the company or its representative parlays the insights from an unsuccessful venture to advance professionally. What is less clear in these discussions is how failure operates at the industry level. What happens when an entire industry fails? Is it possible in such cases for the edification necessary for "failing forward" to occur? What can we as researchers learn from the failure of an entire industry? I take up these questions by looking specifically at the decline and reemergence of a commercial model for online privacy protection

originally piloted in the 1990s. By situating this research in the fields of media archaeology, business history, and media industry research, I aim to avoid essentialist narratives of technological progress and assert a role for failed institutions in the definition of industry landscapes.

Failure in the Privacy Industry: The Rise and Fall (and Rise) of Infomediaries

In a 1997 *Harvard Business Review* article titled "The Coming Battle for Customer Information," John Hagel III and Jeffery F. Rayport noted a growing consumer concern regarding the collection and use of personal information captured through the tracking of online behaviors. Unlike many of their contemporaries who chalked these concerns up to fears about personal privacy, Hagel and Rayport positioned the conflict in purely economic terms. Consumers, they argued, were becoming aware of the implicit contract they consented to when they engaged online. This tacit agreement, which allowed companies to collect their personal and behavioral information in exchange for access to content, is articulated in the well-worn axiom "if you aren't paying for the content, you are the content." This was a deal, Hagel and Rayport argued, that consumers were rejecting. "We are witnessing the growth of a 'privacy' backlash among consumers," they wrote, "which we believe has less to do with the desire to keep information about themselves confidential and more to do with the pragmatic assessment that the returns for the information they divulge are, simply put, unsatisfactory."[37] In this piece, Hagel and Rayport cast debates about digital privacy in economic terms focusing on ownership and control over the collection and circulation of valuable personal information.

By using economic terms to explain the public's aversion to the surreptitious tracking of their online activities, Hagel and Rayport created space for arguments about privacy rights that did not rely on ethical or moral assertions. Instead, they constructed privacy as a tradeoff in which people could leverage the value of their personal information for access to content, deals, or rewards. Suggesting that most people would jump at the opportunity to trade personal information for profit, Hagel and Rayport predicted the rise of *infomediaries*—companies that would act as brokers by helping individuals to collect and organize their information and bargain with vendors for its sale. Infomediaries, as described by the authors, would shift the balance of power from companies to consumers by allowing individuals to engage in a range of online activities without sacrificing their ability to control when and how their personal information was accessed and used.[38]

The Rise of the First Generation Infomediaries

By the late 1990s, a number of companies were developing and piloting a version of the infomediary model to help consumers protect their privacy and control their information online. Tech start-ups such as Lumeria, Privada, PrivaSeek, and iPrivacy not only sought to provide users with the ability to shield information about their online activities from third parties, but also aimed to provide tools that would allow them to capture the data resulting from their online activities. By providing tools for individuals to collect, combine, and store information about a range of digital behaviors, these companies intended to create a competitive advantage for their clients who would act as the gatekeepers to a valuable trove of personal information and behavioral data that could be sold to trusted vendors and advertisers in exchange for deals or promotions.

While the infomediaries each used proxy servers and encryption to shield clients' internet protocol (IP) addresses and prevent websites from tracking their behaviors, each company differentiated itself by offering unique opportunities for users to maintain their anonymity while engaging in the expanding digital world. Lumeria, for example, described its tool as the "MeBay" platform (Fred Davis, personal communication, October 14, 2013). Through this tool, clients would be able to sell information about themselves and their consumer preferences. Data about their online activities, however, would be invisible to the websites they visited. This way, clients could select the specific types of information they wanted shared with particular companies and receive compensation for their disclosure. iPrivacy proposed a similar platform, which they called a selling circle, through which clients could aggregate their anonymized information with others for bulk sale to advertisers and marketers (Salvatore Stolfo, personal communication, October 14, 2013). In exchange for their information, clients who participated in the selling circle would receive a cut of the proceeds from its sale.

Some infomediaries were developing tools that would help clients protect their privacy while still engaging in the growing online marketplace. In addition to their anonymization services, iPrivacy and Privada both aimed to offer their clients options for private shopping and shipping. iPrivacy had plans for single-use credit cards and had negotiated a partnership with established delivery services (Salvatore Stolfo, personal communication, October 14, 2013). Privada had forged a similar relationship with a different shipping company (Rick Jackson, personal communication, February 14, 2014). Using these tools and partnerships, the infomediaries aimed to help their clients engage in anonymous online shopping and shipping. Through these strategies, these companies encouraged users to take advantage of e-commerce while maintaining the ethos of anonymity that characterized the early web.

Despite these slight variations, the entrepreneurs behind the infomediaries shared a concern about a consumer backlash if digital retailers, advertisers, and data brokers continued to mishandle personal information. According to Steve Lucas, PrivaSeek's chief information officer, "[c]onsumers are going to walk away from companies that don't respect their privacy."[39] These actors identified a tension within a population that wanted to take advantage of the conveniences and pleasures of online engagement but had legitimate fears about the security and privacy of personal information shared online. To respond to these concerns, the infomediaries envisioned a system of digital information management that privileged individual control. They understood that decisions to opt in and opt out of consumer surveillance and information sharing were not one-off choices, but an ongoing set of negotiations. By creating the infrastructure for individuals to collect and store their digital data and determine when they would be shared and with whom, the infomediaries foresaw a way to support, and commodify, the growth of digital retail while maintaining consumer autonomy and anonymity.

The Fall of the First Generation Infomediaries

At the turn of the twenty-first century, there was optimism about the possibilities of privacy-enhancing technologies to maintain consumer privacy while facilitating the growth of online commercial activities. While these services responded to a palpable concern among consumers about online privacy, they also addressed fears shared by those in government and

business that the growth of e-commerce would be hindered by these concerns. Some of the infomediaries had attracted venture funding and commercial partners. Regulators had also demonstrated confidence that the growth of consumer-centric privacy services could mitigate the need for government intervention.[40] PrivaSeek, for example, presented its services at a hearing before the House Commerce Committee on Telecommunications, Trade and Consumer Protection in 1999. In his testimony, Steven Lucas offered infomediaries, like PrivaSeek, as a way to add enhanced user choice into existing strategies of industry self-regulation.[41]

The optimism about the future of consumer privacy services faded as companies piloting this model folded at the start of the twenty-first century. It would be reasonable to attribute this breakdown as a failure on the part of the industry to understand consumers' interest in or willingness to pay for privacy-enhancing services. Discussions with the entrepreneurs behind these companies, however, reveal a different rationale for their lack of commercial success. When reflecting on their efforts to bring infomediary services to market, the entrepreneurs I spoke with cited economic and political trends, rather than a lack of consumer interest, as the reason their companies went under.

Like many technology companies, those promoting privacy-enhancing solutions had difficulty gaining financial backing in the wake of the dot-com crash. Certainly, the entrepreneurs behind the infomediaries remember difficulties getting financial backing after the bubble burst around 2001; however, they tend to point to the shift in the political climate around privacy following the events of September 11, 2001, as the real nail in the coffin of privacy-enhancing services. In the aftermath of the attacks on the World Trade Center in New York City, those in the privacy industry report that investors were hesitant to contribute to services that would allow for more secrecy online. The subsequent introduction of the *Patriot Act*, which increased the government's ability to access information about citizens, created a further incentive for financial backers to pull out of many privacy-related projects. iPrivacy cofounder Salvatore Stolfo remembers that the crash that followed the events of September 11, 2001, caused their financial partners to pull back temporarily. This was compounded by the introduction of the *Patriot Act*, which Stolfo described as having "put a chill down the spine of all the lawyers" who did not want to be involved in the provision of anonymous online spaces (Stolfo, personal communication, October 14, 2013).

Pervasive security concerns also served to effectively kill much of the legislation that had been introduced to address apprehensions about the collection and use of personal information online. A number of privacy bills that had been on the government timetable stalled in the wake of the September 11 attacks.[42] Rick Jackson, chief executive officer (CEO) of an infomediary called Privada, described a dramatic shift in the legislative environment after the Republican government took over in 2000 and privacy bills began to fall off of the agenda. The result, he observed, was a rapid governmental shift that resulted in "literally every privacy bill that was looking so promising, that was going to come through, actually went off the floor" (personal communication, February 14, 2014). With privacy rights no longer occupying a central space in the policy landscape, infomediaries and other privacy-enhancing services lost a powerful argument in their favor.

In the absence of an active commercial privacy industry or effective regulatory oversight, thinking about how to protect digital information underwent a significant transformation.

The introduction of interactive technologies helped popularize tools that encouraged the use of "real" online identities.[43] By the mid-2000s, mainstream digital culture was no longer invested in the maintenance of an anonymous web or the forms of cloaked exchanges advocated by the early infomediaries. In fact, identity authentication had become the core of cultural, economic, and technical operations of the web. The rising popularity of social network sites—including Friendster, MySpace, YouTube, and Facebook—facilitated online communication within existing offline networks and helped to merge the "virtual" and "real" worlds that had previously been conceptualized as separate spaces. While architectures of the early web are remembered as encouraging the performance of multiple personae,[44] features of the social web privilege the use of a single, consistent, and unified identity.[45] In the face of growing social and economic incentives for disclosure, the political economy of the web shifted away from opportunities for anonymity. The result was that companies looking to provide privacy-enhancing solutions to consumers were operating in an environment in which digital visibility was positioned as both inevitable and expected.

The Reemergence of the Infomediary

Within this socioeconomic context, a collection of entrepreneurs has resurrected the infomediary model as a strategy to address a pervasive anxiety about the growing sophistication of the contemporary consumer surveillance environment. Similar to the early infomediaries, companies such as Enliken, Datacoup, Personal, Reputation.com, and The Locker Project question the fairness of an online economy that relies on the collection and analysis of personal data without providing compensation to the data subject. Similar to the early infomediaries, these start-ups are invested in creating tools that promote autonomy by allowing individuals to intervene in the data economy and profit from the collection and use of their personal information.

Each company in this new generation of infomediaries has or is developing a tool—alternately called a data vault, store, or locker—that will allow individuals to collect, manage, and store a range of digital information. As with the previous generation of start-ups, each company emphasizes a slightly different feature of its information management service. While Personal was focused on helping individuals input, store, and share information such as credit card numbers, passwords, and addresses, Reputation.com is developing strategies for authentication that would allow individuals to leverage a verified reputation to attest to their eligibility for products or services without the unnecessary exposure of personal information.[46]

Although Personal and Reputation.com have both expressed interest in helping individuals sell their personal information to third parties, Enliken and Datacoup have pursued this model more directly. Enliken is developing a platform that will allow users to trade their data for perks. Mark Guldimann, founder of the infomediary Enliken, describes the development of a software product that will allow online retailers to display the information they have about a consumer when asked. Guldimann calls this "transparency as a service" and argues it will allow companies to engage consumers in a discussion about how their data should be used (personal communication, October 11, 2013). By showing consumers the channels through which data have been collected about them and the conclusions drawn based on those data, the company believes individuals will be given the chance to engage in the process in a way that will improve outcomes for buyers and sellers.

Datacoup's Matt Hogan describes his company as a "personal data exchange" that aims to provide consumers with an opportunity to "aggregate, visualize, and sell their own personal data" (personal communication, October 16, 2013). At the core of Datacoup's mission is to "create a more efficient market for consumer data" (personal communication, October 16, 2013). Under the tagline "reclaim your personal data," Datacoup works to allow the user to combine and control two datasets that Hogan believes reside at the heart of online behavioral advertising: social data and financial data. Advertisers covet these categories of information because of the insights they believe can be revealed once they are combined; however, as Hogan points out, accurate financial and social information is difficult to get without the assistance of the data subject. By bringing in the consumer, Datacoup hopes to access information that is both accurate and organic. Like Enliken, Datacoup's goal is to build a more valuable database of consumer information by including consumers in the creation and correction of their own profiles.

By allowing individuals to act as the central point of aggregation for their personal data, each of these companies aims to help its customers create a dataset that is more comprehensive than anything commercial data brokers could technically or legally build on their own. As the point of aggregation for the information currently contained in data silos, the second generation infomediaries propose to give individuals an advantage over data brokers by allowing them to combine and correct existing records. By providing the technology to help uncover and represent the narratives hidden in consumer data trails, the infomediaries aim to help individuals tell a more holistic and accurate story about themselves, thereby adding an additional layer of value to existing data. Collectively, these companies are aiming to shift the way data are collected and controlled in ways that disrupt the existing relationship between consumers and retailers without fundamentally challenging the dominant economic structures of the web.

Juxtaposing the First and Second Generation Infomediaries

Although the companies involved in the resurrection of the infomediary model borrow heavily from the logics of user empowerment and data ownership that informed the early infomediaries, there is a fundamental difference in the range of options offered to users. Unlike the entrepreneurs behind the early infomediaries who, through their proxy servers and anonymous shopping and shipping options, aimed to provide opportunities for practical invisibility online, actors in the contemporary industry no longer view anonymity as a viable or desirable option. Given the realities of digital architecture, anonymity is no longer seen as a technical option for most people; with few exceptions, the approach taken by the contemporary infomediaries implies the ability to profit from one's personal information is a more desirable and attainable goal.

The goal of the first generation infomediaries was to create an environment that privileged anonymity as the default, and the entrepreneurs behind these services aimed to create an online world where engagement in the digital economy—in which personal, anonymous information was exchanged for value—was predicated on the individual's choice to opt in. These companies advocated a digital architecture that did not hinge on the use of a real or consistent user identity. In the contemporary landscape, a willingness to participate in economic transactions that exchange information for service is regularly positioned a

precondition for engagement with digital and mobile platforms. The privacy options for individuals—and for companies that offer privacy-enhancing services—have narrowed.

Contemporary privacy services are forced to confront an environment in which anonymity has been repositioned as a less attractive option than visibility. As a result, these companies are responding to a definition of privacy that is undergoing constant renegotiation as the public tries to make sense of what the term means in this new environment. Rather than focusing on ways to disrupt the capture of personal information online, the second generation infomediaries look for ways to achieve greater efficiencies. Instead of emphasizing anonymity, the new companies focus on the value of disclosure: how much is the data subject willing to reveal and for what price? The personal data ecosystem operates within a digital culture that has evolved immensely over the past two decades. In this environment, the choice to opt out is no longer positioned as a real alternative. As a result, the option individuals are left with surrounds the extent to which they are willing to embrace the culture of visibility and sharing that has become dominate online and whether or not they engage with tools that allow them to take advantage of their disclosures.

Learning from Failure

The similarities between the ideological and technological approaches shared by the first and second generation infomediaries are unmistakable. Both sets of companies raise concerns about the inefficiencies created by the destruction of trust in the online economy that results when commercial actors are not transparent about the ways they collect and use consumer information. Both sets of companies also argue for the application of ownership rights to personal data and suggest that allowing individuals to control the flows of their information can mitigate fears about the erosion of privacy. They propose similar technical solutions—data vaults, the anonymous sale of information, and data brokerage—to create an environment in which respecting individuals' right to manage their personal information leads to a more efficient marketplace.[47]

Given the commercial failure of the early infomediaries, one wonders why contemporary actors are confident about the future prospects of the infomediary model. Does this optimism reflect a type of institutional amnesia regarding the fate of previous businesses? Or is there a sense the political, economic, and social landscape has evolved sufficiently to allow these companies to succeed where their predecessors failed? A common refrain among those behind the first and second generation infomediaries is that the earlier companies were ahead of their time. The reasons contemporary entrepreneurs give for their optimism about the model's potential for success in the current environment include technological advances that make possible more sophisticated platforms, consumer awareness and concern about digital privacy in the face of growing surveillance, political interests in supporting opportunities for consumer privacy, and concerns from the business community about a backlash on the part of consumers who object to the ways companies are handling their personal information.[48] A careful analysis of the discourses surrounding the appearance of the first wave infomediaries, however, reveals many of these same observations and arguments were used to explain the emergence of the infomediary model less than two decades previous.

The limits of this exceptionalist mentality, which supports a vision of the present as a distinctive moment without historic parallels, serve as a useful reminder for the value of historicizing

new media industry research—a project that is well attended to by media historians.[49] Without an understanding of the first generation infomediaries, it would be rational to consider the emergence of their contemporary counterparts as a response to a unique set of concerns about commercial surveillance facilitated by the ubiquity of digital technologies that generate mass quantities of data exhaust as a byproduct of use. But to do so would be to ignore the persistence of these concerns and the enduring power of an industrial response that frames personal information as a consumer good.

It was, after all, the first generation infomediaries that defined digital privacy as an economic issue, opening the door to solutions that promoted financial compensation for personal disclosure. In fact, there is a danger inherent in cloaking the first generation infomediaries in narratives of failure. To do so means running the risk of obscuring the important part these companies played in setting the terms for debates that continue to frame digital privacy as an economic trade-off.[50] As Fridenson writes, "failure does not necessarily dislodge the inherent vision behind the failure."[51] In other words, the ideological contribution of products, services, or industries can outlive their commercial viability. The ideologies that informed the infomediary model, namely, treatment of personal information as a commodity, did not disappear when the companies that pioneered this solution shut their doors.

By treating the demise of the first generation infomediaries as a simple case of market failure, it would be similarly easy to assume consumers lacked the necessary interest or investment in personal privacy to pay for services that would help them protect their digital information. But to do so would be to overlook the complex external factors that contributed to the demise of these companies. Rather than assuming that the death of the infomediary model in early twenty-first century was inevitable, it is useful to think about its disappearance as contextually dependent—contingent on political events and social conditions. Moreover, it is important to think about what the consequences of the absence of these industry voices from the public discourse around digital privacy might have been.

As privacy slipped from the American political agenda in the early twenty-first century, the incentives for actors in digital industries to self-regulate around the collection and use of personal information faded. But what if the infomediary model had been successful? What if consumer privacy had continued to be a central issue on the government's agenda? If infomediaries had been empowered in their vision of an internet architecture that is not dependent on identity markers, how might that have changed current arguments about the ethics of a "real name" web?[52] Would the infomediaries' assertion of ownership rights as a way to understand personal data tracking have altered the standard Terms and Conditions that individuals agree to when they use digital and mobile services? The answers to such questions are, of course, hypothetical; however, thinking about them helps to reinforce the contingent nature of our current technological environment. Far from being natural or predetermined, this environment is the result of historical conditions, choices, and accidents.

The companies that make up the consumer privacy industry, like many other technology start-ups, tend to be privately funded companies. Consequently, it is difficult to gauge their economic viability and success; however, the importance of these companies for media industries researchers does not stem exclusively from an assessment of their short-term financial

viability or even their long-term economic success. Rather, the power of these companies comes from an evaluation of ideologies that shape our cultural debates. Take, for example, the digital start-ups that have, over the past two decades, aimed to create consumer products to help manage the persistence and spread of digital content by building communication channels that allow text to vanish after a certain period of time. Likely, the most well-known of these apps is Snapchat, an app that has experienced mass-market popularity since 2012 based in part on its support for the exchange of ephemeral content. A focus on the success of Snapchat, however, may obscure unsuccessful predecessors (e.g., TigerText and Vanish), competitors (e.g., Fade and Facebook's Poke), and similar products targeted at niche populations rather than the mainstream (e.g., Signal). What can we learn when we treat Snapchat, not as an anomaly, but within a longer tradition of commercially successful and unsuccessful efforts to build ephemeral messaging?

An analysis of industrial failure allows for a specific type of intervention. Jackson writes that it is "precisely in moments of breakdown that we learn to see and engage our technologies in new and sometimes surprising ways."[53] A study of failure is similar. Although much of the logic at the heart of the infomediary model remains consistent, the differences in how the industrial ideology is operationalized and executed reveal a dramatic narrowing in the ways companies envision the value of consumer privacy online. In comparing discourses deployed at different moments in an industry's history and in assessing the ideological fissures between them, we can identify these changes in the cultural, economic, and political conditions that inform their development. It is precisely in their cycles of success and failure then that these companies become rich sites of analysis.

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[2] Although this article does not explicitly take up issues of gender and race, it is worth nothing that many of these icons of failure are white and male—a pattern that suggests the strategy of successful failure may not be equally accessible to all entrepreneurs.

[3] "Fail Often, Fail Well," *The Economist*, April 16, 2011, http://www.economist.com/printedition/2011-04-16.

[4] Armend S. Tahirsylaj, "Stimulating Creativity and Innovation through Intelligent Fast Failure," *Thinking Skills and Creativity* 7, no. 3 (December 2012): 265–70. doi:10.1016/j.tsc.2012.05.005.

[5] Jack V. Matson, *The Art of Innovation: Using Intelligent Fast Failure* (State College: Pennsylvania State University Press, 1991), 35.

[6] Jack V. Matson, *Innovate or Die: A Personal Perspective on the Art of Innovation* (Royal Oak, MI: Paradigm Press, 1996), 50.

[7] Economists assert that remaining committed to initiatives that are destined to fail is an irrational, but common behavior. In their documentation of the sunk cost fallacy, Hal Arkes and Catherine Blumer note, "The prior investment, which is motivating the present decision to continue, does so despite the fact that it objectively should not influence the decision." Hal R. Arkes and Catherine Blumer, "The Psychology of Sunk Cost," *Organizational Behavior and Human Decision Processes* 35, no. 1 (February 1985): 124. doi:10.1016/0749-5978(85)90049-4.

[8] Gina Neff, *Venture Labor: Work and the Burden of Risk in Innovative Industries*, Acting with Technology (Cambridge: The MIT Press, 2012).

[9] Kenneth Lipartito, "Picturephone and the Information Age: The Social Meaning of Failure," *Technology and Culture* 44, no. 1 (2003): 53. doi:10.1353/tech.2003.0033.

[10] Helmut K. Anheier and Lynne Mouton, "Organizational Failures, Breakdowns, and Bankruptcies: An Introduction," In *When Things Go Wrong: Organizational Failures and Breakdowns*, edited by Helmut K. Anheier (Thousand Oaks: SAGE, 1999), 4; Patrick Fridenson, "Business Failure and the Agenda of Business History," *Enterprise and Society* 5, no. 4 (December 2004): 570. doi:10.1093/es/khh077.

[11] Steven J. Jackson, "Rethinking Repair," in *Media Technologies: Essays on Communication, Materiality, and Society*, Inside Technology, edited by Tarleton Gillespie, Pablo J. Boczkowski, and Kirsten A. Foot (Cambridge: The MIT Press, 2014), 234–35.

[12] David J. Phillips, "Privacy Policy and PETs: The Influence of Policy Regimes on the Development and Social Implications of Privacy Enhancing Technologies," *New Media & Society* 6, no. 6 (2004): 691–706.

[13] Nora A. Draper, *Reputation Inc.: The Industrialization of Digital Self-Presentation and Online Privacy* (Philadelphia: University of Pennsylvania, 2014).

[14] Lipartito, "Picturephone and the Information Age" performs such a thought experiment in his research on the picturephone.

[15] Niels Brügger, "Web Historiography and Internet Studies: Challenges and Perspectives," *New Media & Society* 15, no. 5 (August 2013): 752–64. doi:10.1177/1461444812462852.

[16] Ibid., 753.

[17] Lisa Gitelman, *Always Already New: Media, History and the Data of Culture* (Cambridge: The MIT Press, 2008).

[18] See Megan Sapnar Ankerson, "Read/Write the Digital Archive: Strategies for Historical Web Research," in *Digital Research Confidential: The Secrets of Studying Behavior Online* (Cambridge: The MIT Press, 2016), 29–54.

[19] N.V., "Difference Engine: Lost in Cyberspace," *The Economist*, July 9, 2012, http://www.economist.com/blogs/babbage/2012/07/digital-archives-0.

[20] There have been increasingly systematic efforts, such as the Internet Archive's Wayback Machine, to document the changing web. See Kalev Leetaru, "The Internet Archive Turns 20: A Behind the Scenes Look at Archiving the Web," *Forbes*, January 18, 2016, http://www.forbes.com/sites/kalevleetaru/2016/01/18/the-internet-archive-turns-20-a-behind-the-scenes-look-at-archiving-the-web/#2715e4857a0b6d4f38cc7800.

[21] An incomplete list of this work includes Fred Turner, *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism* (Chicago: University of Chicago Press, 2006); Stephanie Ricker Schulte, *Cached: Decoding the Internet in Global Popular Culture* (New York: New York University Press, 2013); Jonathan Zittrain, *The Future of the Internet and How to Stop It* (New Haven: Yale University Press, 2008); Jack L. Goldsmith and Tim Wu, *Who Controls the Internet? Illusions of a Borderless World* (New York: Oxford University Press, 2008); Tim Wu, *The Master Switch: The Rise and Fall of Information Empires*, 1st Vintage Books ed. (New York: Vintage Books, 2011); Lawrence Lessig, *Code: And Other Laws of Cyberspace, Version 2.0*, 2nd ed. (New York: Basic Books, 2006); Megan Sapnar Ankerson, "Web Industries,

Economies, Aesthetics: Mapping the Look of the Web in the Dot-Com Era," in *Web History*, edited by Niels Brügger (New York: Peter Lang, 2010), 173–93.

[22] See Jussi Parikka, *What Is Media Archaeology?* (Cambridge: Polity Press, 2012), 12–14 on alternative histories.

[23] Jackson, "Rethinking Repair," 230–31.

[24] Stuart Hall, "Notes on Deconstructing 'the Popular,'" in *People's History and Socialist Theory*, History Workshop Series, edited by Raphael Samuel (London: Routledge and Kegan Paul, 1981), 227–40.

[25] Fridenson, "Business Failure and the Agenda of Business History," 563.

[26] Lipartito, "Picturephone and the Information Age."

[27] Ibid., 52.

[28] Parikka, *What Is Media Archaeology?*, 2.

[29] Ibid.

[30] The Social Construction of Technology (SCOT) research agenda, which explores the mutual shaping of technology and culture, takes a similar perspective. Wiebe E. Bijker describes the SCOT methodological approach as "help[ing] to avoid prioritising winners over losers, successful machines over failing ones, the working of technology over the non-working." Instead, Bijker argues, "the methodological dictum is to follow the social processes and thus empirically find out what makes up well-working, success and winners. The focus is more on understanding the process than on describing the product." W. E. Bijker, "How Is Technology Made? That Is the Question!," *Cambridge Journal of Economics* 34, no. 1: 68. doi:10.1093/cje/bep068.

[31] Lisa Parks and Nicole Starosielski, *Signal Traffic: Critical Studies of Media Infrastructures*, The Geopolitics of Information (Urbana: University of Illinois Press, 2015).

[32] Ibid., 6.

[33] Victor Pickard, "Reopening the Postwar Settlement for U.S. Media: The Origins and Implications of the Social Contract between Media, the State, and the Polity," *Communication, Culture & Critique* 3, no. 2 (June 2010): 170–89. doi:10.1111/j.1753-9137.2010.01065.x.

[34] Ankerson, "Web Industries, Economies, Aesthetics," 174–75.

[35] Neff, *Venture Labor*.

[36] Alice Marwick, *Status Update: Celebrity, Publicity, and Branding in the Social Media Age* (New Haven: Yale University Press, 2013), 13. Marwick notes, however, that while failure is an accepted part of the industry, it is a less dominant trope than the "great man" myth in which a single entrepreneur changes the landscape through an innovative product.

[37] John Hagel III and J. F. Rayport, "The Coming Battle for Customer Information," *Harvard Business Review* 75, no. 1 (1997): 6.

[38] John Edward Campbell and Matt Carlson, "Panopticon.com: Online Surveillance and the Commodification of Privacy," *Journal of Broadcasting & Electronic Media* 46, no. 6 (2002): 586–606.

[39] Quoted in Anne Colden, "Privacy Comes into Full View," *The Denver Post*, July 30, 2000, sec. Business.

[40] See, for example, Orrin Hatch, "Know the Rules, Use the Tools: Privacy in the Digital Age: A Resource for Internet Users" (Washington: U.S. Senate Judiciary Committee, September 20, 2000).

[41] Steve Lucas, "Prepared Testimony of Statement of Mr. Steve Lucas Chief Information Officer and Senior Vice President, Industry Government Affairs before the House Commerce Committee Telecommunications, Trade and Consumer Protection Subcommittee," *Federal News Service*, July 13, 1999, sec. Financial News, http://www.gpo.gov/fdsys/pkg/CHRG-106hhrg58511/html/CHRG-106hhrg58511.htm.

[42] Draper, *Reputation Inc.*

[43] Alice Marwick, "Selling Your Self: Online Identity in the Age of a Commodified Internet" (Unpublished master's thesis, University of Washington, 2005); Liam Berriman and Rachel Thomson, "Spectacles of Intimacy? Mapping the Moral Landscape of Teenage Social Media," *Journal of Youth Studies* 18, no. 5 (May 2015): 583–97. doi:10.1080/13676261.2014.992323.

[44] See, for example, Sherry Turkle, *Life on Screen: Identity in the Age of the Internet* (New York: Simon & Schuster, 1995).

[45] Alice Marwick and danah boyd, "I Tweet Honestly; I Tweet Passionately: Twitter Users, Context Collapse, and the Imagined Audience," *New Media & Society* 13, no. 1 (2010): 114–33; José van Dijck, "'You Have One Identity': Performing the Self on Facebook and LinkedIn," *Media, Culture & Society* 35, no. 2 (2013): 199–215.

[46] Natasha Singer, "Your Digital Switzerland: An Entrepreneur Builds a Virtual Vault to Secure Personal Data," *The New York Times*, December 9, 2012, sec. BU.

[47] Arvind Narayanan, Solon Barocas, Vincent Toubiana, and Helen Nissenbaum, "A Critical Look at Decentralized Personal Data Architectures," February 21, 2012. http://arxiv.org/pdf/1202.4503.pdf.

[48] Draper, *Reputation Inc.*

[49] See, for example, Susan Jeanne Douglas, *Inventing American Broadcasting, 1899-1922*, Johns Hopkins Paperbacks ed., Johns Hopkins Studies in the History of Technology (Baltimore: Johns Hopkins University Press, 1989); Carolyn Marvin, *When Old Technologies Were New: Thinking about Electric Communication in the Late Nineteenth Century* (New York: Oxford University Press, 1990); Lynn Spigel, *Make Room for TV: Television and the Family Ideal in Postwar America* (Chicago: University of Chicago Press, 1992).

[50] Nora A. Draper, "From Privacy Pragmatist to Privacy Resigned: Challenging Narratives of Rational Choice in Digital Privacy Debates," *Policy & Internet* 9, no. 2 (2016). doi:10.1002/poi3.142.

[51] Fridenson, "Business Failure and the Agenda of Business History," 571.

[52] Robert Bodle, "The Ethics of Online Anonymity or Zuckerberg vs. 'MOOT,'" *Computers and Society* 43, no. 1 (2013): 22–30.

[53] Jackson, "Rethinking Repair," 230.

Bibliography

Anheier, Helmut K., and Lynne Mouton. "Organizational Failures, Breakdowns, and Bankruptcies: An Introduction." In *When Things Go Wrong: Organizational Failures and Breakdowns*, edited by Helmut K. Anheier, 3–14. Thousand Oaks, CA: SAGE, 1999.

Ankerson, Megan Sapnar. "Read/Write the Digital Archive: Strategies for Historical Web Research." In *Digital Research Confidential: The Secrets of Studying Behavior Online*, 29–54. Cambridge: The MIT Press, 2016.

Ankerson, Megan Sapnar. "Web Industries, Economies, Aesthetics: Mapping the Look of the Web in the Dot-Com Era." In *Web History*, edited by Niels Brügger, 173–93. New York: Peter Lang, 2010.

Arkes, Hal R., and Catherine Blumer. "The Psychology of Sunk Cost." *Organizational Behavior and Human Decision Processes* 35, no. 1 (February 1985): 124–40. doi:10.1016/0749-5978(85)90049-4.

Berriman, Liam, and Rachel Thomson. "Spectacles of Intimacy? Mapping the Moral Landscape of Teenage Social Media." *Journal of Youth Studies* 18, no. 5 (May 2015): 583–97. doi:10.1080/13676261.2014.992323.

Bijker, Wiebe. E. (2010). "How Is Technology Made? That Is the Question!." *Cambridge Journal of Economics* 34, no. 1: 63–76. doi:10.1093/cje/bep068.

Bodle, Robert. "The Ethics of Online Anonymity or Zuckerberg vs. 'MOOT.'" *Computers and Society* 43, no. 1 (2013): 22–30.

Brügger, Niels. "Web Historiography and Internet Studies: Challenges and Perspectives." *New Media & Society* 15, no. 5 (August 2013): 752–64. doi:10.1177/1461444812462852.

Campbell, John Edward, and Matt Carlson. "Panopticon.com: Online Surveillance and the Commodification of Privacy." *Journal of Broadcasting & Electronic Media* 46, no. 6 (2002): 586–606.

Colden, Anne. "Privacy Comes into Full View." *The Denver Post*, July 30, 2000, sec. Business.

Dijck, José van. "'You Have One Identity': Performing the Self on Facebook and LinkedIn." *Media, Culture & Society* 35, no. 2 (2013): 199–215.

Douglas, Susan Jeanne. *Inventing American Broadcasting, 1899-1922*. Johns Hopkins Paperbacks ed. Johns Hopkins Studies in the History of Technology. Baltimore: Johns Hopkins University Press, 1989.

Draper, Nora A. "From Privacy Pragmatist to Privacy Resigned: Challenging Narratives of Rational Choice in Digital Privacy Debates." *Policy & Internet* 9, no. 2 (2016). doi:10.1002/poi3.142.

Draper, Nora A. *Reputation Inc.: The Industrialization of Digital Self-Presentation and Online Privacy*. Philadelphia: University of Pennsylvania, 2014.

"Fail Often, Fail Well." *The Economist*, April 16, 2011. http://www.economist.com/printedition/2011-04-16.

Fridenson, Patrick. "Business Failure and the Agenda of Business History." *Enterprise and Society* 5, no. 4 (December 2004): 562–82. doi:10.1093/es/khh077.

Gitelman, Lisa. *Always Already New: Media, History and the Data of Culture*. Cambridge: The MIT Press, 2008.

Goldsmith, Jack L., and Tim Wu. *Who Controls the Internet? Illusions of a Borderless World*. New York: Oxford University Press, 2008.

Hagel, John, III, and J. F. Rayport. "The Coming Battle for Customer Information." *Harvard Business Review* 75, no. 1 (1997): 5–11.

Hall, Stuart. "Notes on Deconstructing 'the Popular.'" In *People's History and Socialist Theory*, edited by Raphael Samuel, 227–40. History Workshop Series. London: Routledge and Kegan Paul, 1981.

Hatch, Orrin. "Know the Rules, Use the Tools: Privacy in the Digital Age: A Resource for Internet Users." Washington: U.S. Senate Judiciary Committee, September 20, 2000.

Jackson, Steven J. "Rethinking Repair." In *Media Technologies: Essays on Communication, Materiality, and Society*, edited by Tarleton Gillespie, Pablo J. Boczkowski, and Kirsten A. Foot, 221–39. Inside Technology. Cambridge, MA: The MIT Press, 2014.

Leetaru, Kalev. "The Internet Archive Turns 20: A Behind the Scenes Look at Archiving the Web." *Forbes*, January 18, 2016. http://www.forbes.com/sites/kalevleetaru/2016/01/18/the-internet-archive-turns-20-a-behind-the-scenes-look-at-archiving-the-web/#2715e4857a0b6d4f38cc7800.

Lessig, Lawrence. *Code: And Other Laws of Cyberspace, Version 2.0*. 2nd ed. New York: Basic Books, 2006.

Lipartito, Kenneth. "Picturephone and the Information Age: The Social Meaning of Failure." *Technology and Culture* 44, no. 1 (2003): 50–81. doi:10.1353/tech.2003.0033.

Lucas, Steve. "Prepared Testimony of Statement of Mr. Steve Lucas Chief Information Officer and Senior Vice President, Industry Government Affairs before the House Commerce Committee Telecommunications, Trade and Consumer Protection Subcommittee." *Federal News Service*, July 13, 1999, sec. Financial News. http://www.gpo.gov/fdsys/pkg/CHRG-106hhrg58511/html/CHRG-106hhrg58511.htm.

Marvin, Carolyn. *When Old Technologies Were New: Thinking about Electric Communication in the Late Nineteenth Century*. New York: Oxford University Press, 1990.

Marwick, Alice. "Selling Your Self: Online Identity in the Age of a Commodified Internet." Unpublished master's thesis, University of Washington, 2005.

Marwick, Alice. *Status Update: Celebrity, Publicity, and Branding in the Social Media Age*. New Haven: Yale University Press, 2013.

Marwick, Alice, and danah boyd. "I Tweet Honestly; I Tweet Passionately: Twitter Users, Context Collapse, and the Imagined Audience." *New Media & Society* 13, no. 1 (2010): 114–33.

Matson, Jack V. *Innovate or Die: A Personal Perspective on the Art of Innovation*. Royal Oak, MI: Paradigm Press, 1996.

Matson, Jack V. *The Art of Innovation: Using Intelligent Fast Failure*. State College: Pennsylvania State University Press, 1991.

Narayanan, Arvind, Solon Barocas, Vincent Toubiana, and Helen Nissenbaum. "A Critical Look at Decentralized Personal Data Architectures." February 21, 2012. http://arxiv.org/pdf/1202.4503.pdf.

Neff, Gina. *Venture Labor: Work and the Burden of Risk in Innovative Industries*. Acting with Technology. Cambridge: The MIT Press, 2012.

N.V. "Difference Engine: Lost in Cyberspace." *The Economist*, July 9, 2012. http://www.economist.com/blogs/babbage/2012/07/digital-archives-0.

Parikka, Jussi. *What Is Media Archaeology?* Cambridge: Polity Press, 2012.

Parks, Lisa, and Nicole Starosielski, eds. *Signal Traffic: Critical Studies of Media Infrastructures*. The Geopolitics of Information. Urbana: University of Illinois Press, 2015.

Phillips, David J. "Privacy Policy and PETs: The Influence of Policy Regimes on the Development and Social Implications of Privacy Enhancing Technologies." *New Media & Society* 6, no. 6 (2004): 691–706.

Pickard, Victor. "Reopening the Postwar Settlement for U.S. Media: The Origins and Implications of the Social Contract between Media, the State, and the Polity." *Communication, Culture & Critique* 3, no. 2 (June 2010): 170–89. doi:10.1111/j.1753-9137.2010.01065.x.

Schulte, Stephanie Ricker. *Cached: Decoding the Internet in Global Popular Culture*. New York: New York University Press, 2013.

Singer, Natasha. "Your Digital Switzerland: An Entrepreneur Builds a Virtual Vault to Secure Personal Data." *The New York Times*, December 9, 2012, sec. BU.

Spigel, Lynn. *Make Room for TV: Television and the Family Ideal in Postwar America*. Chicago: University of Chicago Press, 1992.

Tahirsylaj, Armend S. "Stimulating Creativity and Innovation through Intelligent Fast Failure." *Thinking Skills and Creativity* 7, no. 3 (December 2012): 265–70. doi:10.1016/j.tsc.2012.05.005.

Turkle, Sherry. *Life on Screen: Identity in the Age of the Internet*. New York: Simon & Schuster, 1995.

Turner, Fred. *From Counterculture to Cyberculture: Stewart Brand, the Whole Earth Network, and the Rise of Digital Utopianism*. Chicago: University of Chicago Press, 2006.

Wu, Tim. *The Master Switch: The Rise and Fall of Information Empires*. 1st Vintage Books ed. New York: Vintage Books, 2011.

Zittrain, Jonathan. *The Future of the Internet and How to Stop It*. New Haven: Yale University Press, 2008.