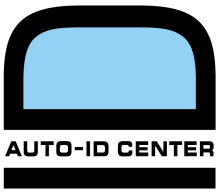
Published November 1, 2002. Distribution restricted to Sponsors until February 1, 2003.



WHITE PAPER

Why Technical Breakthroughs Fail: A History of Public Concern with Emerging Technologies

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ABSTRACT

Due to rapid technological innovation and application, there has been an abundance of both new technologies and public concern with these new technologies over the past two decades. In the face of various public concerns, some of these technical breakthroughs have been successful while many others have been unsuccessful. This white paper examines five cases of technical launches that have taken place during the last fifteen years (Lotus MarketPlace: Households, Caller ID, Pentium III Processor Serial Numbers, Cellular Phones, and Genetically Modified Food), and analyzes what factors led to their ultimate success or failure.

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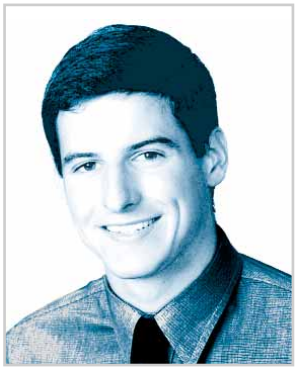
Biography



Brian Cantwell

Brian Cantwell is in his third year at Harvard College earning a BA with Honors in History concentrating on International Relations. He is primarily interested in the controversial trends of globalization and consumerism. His research for the Auto-ID Center deals with providing a historical perspective on new technologies facing public concerns and the resulting effect. At Harvard, Brian enjoys rowing Crew, participating as an active member of the Fox Club and Quincy House, as well as maintaining his fluency in Spanish.

WHITE PAPER

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Contents

1. INTRODUCTION

For the past quarter century, technological development has proceeded at such an incredible pace that the distant futures dreamed up in science-fiction novels and films are now nearly reality. We owe our thanks for this ever-changing new world to a seemingly daily inundation of new technologies. The work of the MIT Auto-ID Center, by introducing Radio Frequency Identification (RFID) tagging to the consumer good supply chain, has the potential not only to continue that trend of technological development, but to recreate the world we live in and the manner in which we interact with it. And yet, as technology has grown, so too have fears, suspicions, and public concerns with technology. It is no longer a matter of technology catching up with human creativity, but rather of human comfort catching up with technology. This realization has become quite apparent over the past fifteen years or so as numerous technical launches have been attempted, with varying degrees of success. Some new technologies are quickly embraced and held up as indications of human progress, while others are strongly protested and shown to be examples of going a step too far. How does one know which step is the one that crosses the line? How can a revolutionary technology such as that being presented by the Auto-ID Center succeed in a fickle world of consumer tastes and fears?

1.1. "The New Landscape"

Privacy advocates Philip Agre and Marc Rotenberg refer to these incredible advances in information and other technologies as creating a "new landscape" with new concerns.[1] In this "new landscape," the primary concern with most information technologies (such as the Auto-ID technology) is privacy. Simon Davies, director of London-based human rights group Privacy International, acknowledges, "If opinion polls accurately reflect community attitudes, concern over privacy violation is now greater than at any other time in recent history."[2] However, Davies claims that the public experiences this concern in a new way. "Privacy advocacy has been recast as a legal and a consumer-rights issue," Davies writes.[3] The explosion of technology driven products on the market has commodified privacy and other public concerns like it, making this "new landscape" one of balances and tradeoffs. Willing consumers trade a little bit of privacy for the promise of benefits like greater security or cheaper prices. Particularly in the wake of 9/11, such matters of balance and tradeoff have become more visible in our society. Privacy advocates, the media, and the general public make common references to "Big Brother," the omniscient, transparent society envisioned by George Orwell in his novel **1984**. Davies distances today's world from that of Big Brother remarking, "The Big Brother society that was imagined in 1970 depended on coercion and fear."[4] Today's companies use marketing ploys and public relations campaigns to convince consumers to sacrifice a little privacy. This is a far cry from governmental oppression inducing fear and coercing a particular lifestyle upon its people. Nonetheless, Big Brother is still used regularly and effectively as a protest tactic by privacy advocates (see 2.3.2 Big Brother Inside).

[1] Agre, Philip E. and Marc Rotenberg, eds., **Technology and Privacy: The New Landscape** (Cambridge Massachusetts: The MIT Press, 1997).

[2] Davies, Simon, "Re-Engineering the Right to Privacy: How Privacy Has Been Transformed from a Right to a Commodity," **Technology and Privacy: The New Landscape**, eds. Philip E. Agre and Marc Rotenberg (Cambridge Massachusetts: The MIT Press, 1997) 143.

[3] Davies, 143

[4] Davies, 144

Such theories as Davies' provide frameworks to help understand the current public attitude towards new technologies and their implications. Yet, as David Brin remarks in his book **The Transparent Society: Will Technology Force Us to Choose Between Privacy and Freedom**, "Theory is fine, but in the long run society's course will be determined by regular folks, whose concerns strike close to home."[5] It is concerns by "regular folks" that caused the technologies discussed in this paper to falter and sometimes fail. Thus, I offer instead a history of real concerns within today's "new landscape." By reviewing real technologies that were introduced by real companies, resulting in real successes or failures, I intend to reveal general patterns of how "regular folks" react to and become concerned with new technologies, and more importantly, how companies effectively and ineffectively respond to those concerns.

[5] Brin, David, **The Transparent Society: Will Technology Force Us to Choose Between Privacy and Freedom** (Reading, Massachusetts: Addison Wesley, 1998) 25.

2. CASES

The following five case studies depict the types of concerns and protests a new technology faces in today's "new landscape." They also show both effective and ineffective corporate reaction to those concerns and identify major players in the controversies.

2.1. Lotus MarketPlace: Households: Too Little Too Late (1990–1991)

In April of 1990, Lotus introduced two database marketing software products, Marketplace: Business and Marketplace: Households. In May of that year, Mary Culnan, then a volunteer in the Washington office of Computer Professionals for Social Responsibility, a human interest group established in the early 1980s, ran across an announcement for the product in the trade magazine **Direct Marketing**. Culnan showed the announcement to Marc Rotenberg, then director of CPSR's Washington office, and the controversy ignited.[6] On May 16th, Rotenberg testified before a House subcommittee on the need for a "data protection board" and cited Lotus MarketPlace as an example of "a computer technology with grave implications for personal privacy."[7]

[6] Culnan, Mary, Interview 8/23/02

[7] Gurak, Laura J., **Persuasion and Privacy in Cyberspace: The Online Protests over Lotus MarketPlace and the Clipper Chip** (New Haven: Yale University Press, 1997) 24.

2.1.1. The Product

Its initial press release described Lotus MarketPlace as a "new desktop information product for the Apple Macintosh personal computers that allows any business person to perform sophisticated sales prospecting and market analysis."[8] The Households version of MarketPlace consisted of 11 CD-ROMs designed for Macintosh computers. Encrypted on those CD-ROMs was personal information, including name, address, age range, gender, martial status, estimated income, dwelling type, type of lifestyle, and shopping habits that had been compiled from Equifax's databases. MarketPlace: Households had information on more than 80 million households, 120 million individuals. The product also included software designed to sort, categorize, and assess the personal information, and then gave the business the opportunity to create mailing lists or make marketing decisions based on those assessments.
To use the product, a "legitimate business" (Lotus maintained that a screening process would be used to ensure that only "legitimate businesses" used the product.[9]) would purchase the software and sample data from a retailer for $695. This included the purchase of the most current CD-ROM and an initial block of 5,000 names, both of which became available after the business returned a signed agreement to Lotus. The business could then purchase more names and addresses, more "Household data slices," or choose to receive quarterly updates. Names and information were unlocked via special access codes given to the business after that information had been purchased.[10]

[8] Gurak, 21

[9] Gurak, 21

[10] Gurak, 22

Lotus had high hopes for MarketPlace: Households. The Business version of the product, which contained information on over 7 million businesses with similar information analysis and list-creating software, had been quite successful and contained only a fraction of the information and capabilities of the Households version. Trade magazines like Direct Marketing heavily praised the product. Also very excited about the product were companies like Apple and Ingram Micro D. Apple's Macintosh computers would run the MarketPlace software, giving them a foothold in the business PC market. Ingram Micro D would distribute the MarketPlace software and promote their new CD-ROM drives in conjunction with it.[11] MarketPlace had the potential to be a revolutionary new technology, bringing direct marketing into the age of personal computing; making Apple Computer a staple of small business marketing, and advancing the development of CD-ROM drives. Something revolutionary would occur, but it would result in Lotus MarketPlace's failure, not its breakthrough success.

[11] O'Dell, John, "Ingram Micro D Scores Exclusive Deal With Lotus; Agreement: Santa Ana Company Will Be Sole U.S. Distributor of Breakthrough MarketPlace Line of Direct Marketing Software," **Los Angeles Times** 30 Aug 1990: Business D5.

2.1.2. "Kindling waiting for a spark"

As mentioned earlier, increased use of computers in the 1970s and 1980s by both government and private organizations had elevated privacy concerns surrounding information technologies.[12] Introduced into this "new landscape" of technology, public concern, and tradeoffs, Lotus MarketPlace hit a nerve with privacy advocates like Marc Rotenberg and CPSR. Privacy advocates then stirred up the public, who reacted via a channel only this "new landscape" could provide: the Internet. This new medium of communication enabled a massive grassroots public opinion campaign to take off and MarketPlace provided the cannon fodder. MarketPlace expert Laura Gurak writes, "By the end of the 1980s, discussions of computers and personal privacy were widespread. Lotus MarketPlace acted as a catalyst…. As one privacy advocate put it, the MarketPlace protest community was 'like kindling waiting for a spark.'"[13]

[12] Gurak, 47

[13] Gurak, 45

CPSR played a large role in "fanning" that spark. They were primarily responsible for bringing MarketPlace to the attention of the media and getting the issue a good deal of press.[14] I asked Mary Culnan to clarify exactly what CPSR's role had been in making the public aware of the various concerns with MarketPlace. She responded, "Privacy advocates, and Marc Rotenberg in particular [were responsible for bringing these issues to the public]. Marc got the Wall St. Journal to write a story. That story got posted in some discussion groups and things took off from there."[15] The article to which Culnan refers, entitled "Lotus Product Spurs Fears about Privacy," appeared in the **Wall Street Journal** on November 13, 1990 and featured interviews with Culnan, Rotenberg, a member of the ACLU and a member of the **Privacy Times** arguing against MarketPlace. These arguments were countered by spokesmen from Lotus and Equifax as well as by Alan Westin, a privacy consultant to Equifax. Online discussions then began to heat up as "the focus of the coverage shifted to privacy concerns"[16] The article was picked up by numerous online message boards, including **RISKS Digest**, where it was dissected and discussed. The grassroots protest had begun. The November 16 electronic issue of **RISKS Digest** contained three postings: the first summarized two articles from **Wall Street Journal**, the second contained an excerpt from an unofficial employee newspaper of Digital Equipment Corporation, and a third posting said that those concerned about the use of their names could write to Lotus and have their name removed from the database, but failed to provide an address.[18] Then in late November, Larry Seiler, a computer professional from New England, received a note about MarketPlace via email, added his own opinions/commentary to it and emailed the result to many within his own company and to some at other organizations. His note was then forwarded and posted all over the Internet. Seiler even received his own email back, with additional opinions and comments, a number of times. By December, privacy concerns surrounding Lotus were getting major media coverage and Lotus was starting to bear the brunt of the public's concern. On one day alone in December, Lotus received nearly six hundred phone calls in relation to MarketPlace, an unheard of number for a company that received approximately a thousand calls a day total for all its products.[19]

[14] Gurak, 45-46

[15] Culnan, Interview 8/23/02

[16] Gurak, 24

[17] **The Risks Digest** (Volume 10: Issue 61) **http://catless.ncl.ac.uk/Risks/10.61.html**

[18] Gurak, 26

[19] Gurak, 28

The concerns that made MarketPlace a substantial "spark" were varied, but revolved around the themes of choice, control of personal information, and security of that information. In fact, it was the very CD-ROM technology that stood to benefit substantially from MarketPlace's success that bothered many privacy advocates. Because of MarketPlace's use of CD-ROM discs (Compact Disc-Read Only Memory), the data on the discs could not be altered or added to if incorrect or incomplete. This also meant that households could not remove their names from the disc. The most a household could hope for was that the access code would no longer unlock their encrypted name. However, many consumers questioned the security of the encryption. Lotus' intention was that businesses would purchase the updated CD-ROMs that had correct information and discard their old ones with the names and information of people who had requested charges or removal, but consumers were not so sure.[20] Mary Culnan cites the fact that "Opt out didn't really work as the CD-ROM's were already out there. There was no way to get them back and remove names, or to insure the product was used responsibly due to the fact that the end-user controlled the lists, not a list broker." By not giving consumers the choice to opt out and by giving control of their personal information to any "legitimate business" willing to pay $695, Lotus handed privacy advocates and the online protest community two huge issues without any effective solution. Many privacy

[20] Gurak, 23

advocates were concerned about a possible technological "domino effect." Some feared that MarketPlace's technology "appears to be moving the nation a bit closer to a day when all information available on one person could be gathered in one place and then easily retrieved, sold or manipulated by virtually anyone."[21] Such images of a future with omniscient corporations and extensive databases invoked fear and paranoia in the public sphere.

[21] Mendel-Black, Daniel, and Evelyn Richards, "Peering into Private Lives; Computer Lists Now Profile Consumersby Their Personal Habits," **The Washington Post** 20 Jan 1991: Financial, H1.

Extrapolations and exaggerations were common in both the online protest community and among the privacy advocates who had started that protest. Gurak comments on the content and tone of the online debate over MarketPlace; "Postings had a range of functions: to inform, to debate the protest, to debate the product, to mobilize, to divulge 'secret information,' and to discuss other privacy-related issues."[22] In the online environment nothing was off limits; there were no boundaries. On one note widely circulated is the Internet was the email address of Lotus President and CEO Jim Manzi, resulting in a rash of unwanted email flooding the CEO's inbox.[23] An example of the exaggeration prevalent in the protest, one letter posted on the Internet erroneously listed all the things supposedly included in Lotus' database, such as kind of car, computer, or stereo owned, investment portfolio, and schools attended by one's children. Most of the items mentioned were blatantly not included in the database, or included in limited form (annual salary was included, but as a range, not an exact figure). On the Internet, protesters were "under no obligation to check sources. The message had grown in each reposting in a way reminiscent of the party game [telephone] where people sit in a circle, someone whispers a phrase, the phrase is passed around the circle in whispers, and the last person says aloud the phrase he or she heard, which by then is a totally different phrase."[24] Yet, "In all the online debate, Lotus' voice was missing. According to a former Lotus employee who was product manager for the MarketPlace group, the company was unfamiliar with the Internet and was thus caught off guard by the power of communication in cyberspace."[25] Misinformation and speculation proved incredibly detrimental to Lotus as the public feared and protested what they did not fully understand. Armed with valid concerns inflated by exaggeration and misunderstanding, the protest community grew quite heated and Lotus' situation became increasingly volatile.

[22] Gurak, 27

[23] Gurak, 29

[24] Gurak, 91

[25] Gurak, 27

2.1.3. Lotus Responds

Prior to MarketPlace's launch, Equifax and Lotus held eight focus groups with consumers and used some of their comments to shape the final product. They also wrote and distributed a "privacy protection pamphlet" to media, government officials, and both privacy and consumer advocacy groups.[26] Despite Lotus and Equifax's efforts, the final MarketPlace product still did not have sufficient privacy controls in the eyes of privacy advocates and the online protest community. A lack of communication between Lotus, Equifax, and their consumers accounts for much of the controversy, misunderstanding, and protest. Gurak writes that Lotus' "efforts to deal with privacy issues were not made explicit to the public. During the online protest, many postings accused Lotus and Equifax of being insensitive and unethical in their approach to personal privacy."[27] Equifax, foreseeing these privacy issues, had hired Alan Westin, a renowned privacy expert and a professor at Columbia, to advise them on the concerns that would arise with MarketPlace. Lotus, on the other hand, was not as aware of the potential concern. Lotus' disconnection from their consumers and their consumers fears was evident in the running of an ad for MarketPlace in **Fortune** that depicted faceless people with bulls-eye targets on their backs.

[26] Gurak, 20-21

[27] Gurak, 21

Figure 1: This advertisement for MarketPlace ran on page 130 of the November 5, 1990 issue of Fortune magazine, just days before the **Wall Street Journal** ran a story that would ignite the massive online protest.

Lotus' disconnection was also evident in the way they handled the online protest. According to one employee, Lotus lacked a "coordinated strategy to fight the Internet."[28] Essentially, Lotus was completely unaware of the online protest until it was too late in the game. By January of 1991, Lotus realized that a response was long overdue and wanted to put one together, but had no idea how or where to post it on the Internet.[29] Finally, on January 3, 1991 Lotus finally posted their note on the Usenet newsgroup comp.society (See Appendix: Lotus' Response). The reaction to the posting was extremely negative and within twenty days the company cancelled its release of MarketPlace: Households. CEO Manzi summed up his own frustration and the reason behind the cancellation in a press release; "Unfortunately, Lotus MarketPlace: Households is at the apex of an emotional firestorm of public concern about consumer privacy."[30]

[28] as qtd. Gurak, 27

[29] Gurak, 28

[30] as qtd. Gurak, 29

Lotus themselves were responsible for being at the apex of that emotional firestorm. In fact, their attempts to ease their consumers' fears had only triggered more hostile protest. Lotus was out of touch with their consumers when it came to the privacy concerns with its product. They were even more naive in their knowledge of the Internet and its capabilities. Most importantly, they were also completely oblivious as to how they should effectively communicate with their consumers. The posting Lotus made to comp.society, in addition to being about three months too late, took on a tone that ran contrary to the language the protesters were speaking in. Rife with strong fears, unfounded exaggerations, and rampant speculation, the online protest was highly emotional. It was the product of a number of regular folks having gut reactions to a technology they were not familiar with. Gurak explains, "Lotus's corporate, top-down style of communication was exactly the opposite of the bottom-up style of the cyberspace protest… Finally, even when the organization did attempt to post to some conferences, Lotus used a logical, fact-driven character, using classic 'business-ese'…which was in direct clash with the emotive, informal style of the protest postings and which in fact angered protesters."[31] This impersonal "business-ese" is immediately exemplified in the opening sentence of Lotus' posting: "In response to recent messages that have appeared here about Lotus MarketPlace, we want to provide some hard facts that we hope will clear up some of the misinformation surrounding our product."[32] By January, the protest community was not seeking "hard facts," rather they wanted reassurance and comfort to ease their fears. They wanted to be reassured that their personal information was not available for the entire world to see, and they wanted to interact with a company that at least acknowledged their concerns. Instead, they received a reply telling them that Lotus was only doing on a small scale what numerous other corporations were doing on a much larger scale. Lotus' argument that most of the information available through MarketPlace was already available elsewhere did nothing to reassure the consumer. No consumer fears were eased by Lotus' claim that they were actually being rather democratic and capitalistic in granting the small "legitimate business" access to that information.[33] Instead of being reassured, Lotus' reply further irritated the public and simply added more fuel to their already raging fire. Lotus then condescendingly and definitively ended their posting with the following sentence: "We hope that this clarifies any questions or concerns." The impersonal tone assumes a superiority of Lotus over the uneducated consumer that the online protest community did not appreciate, particularly considering that much of that community came from a strong computer technology background.

[31] Gurak, 114–115

[32] as qtd. Gurak, 117

[33] Gurak, 119

Could MarketPlace have been salvaged with more effective communication? Quite possibly, but it certainly would have had to come sooner. Gurak notes, "By January 3 [the date Lotus responded]…. The situation had been clearly defined, the community established, and the message, with its truths and its inaccuracies, was well distributed. Only a large-scale, sophisticated rhetorical response by Lotus could have affected the debate at this point. But Lotus's actual response did not have these characteristics." [34] It was a case of too little too late for a technology that Culnan admits "had privacy problems, but [I] did not feel it should be stopped."[35] The fact that a privacy advocate who debatably instigated the entire protest against Lotus felt that the launch was not the evil omen of Big Brother it was made out to be says something about Lotus' mismanagement of the situation. However, Culnan also claims that "Once the ball got rolling [MarketPlace] was doomed," acknowledging the power of privacy advocates online protest, and public concern. In an article for **The New York Times**, Culnan

[34] Gurak, 115

[35] Culnan, Interview, 8/23/02

summed up the lessons learned in the aftermath of the MarketPlace failure as threefold. One, consumers desire control over who has a right to their personal information. Two, as Lotus pointed out in their reply, consumers are not fully aware of the extent to which their personal information is "collected, merged, sold or exchanged" as a part of the direct marking business. And three, the ability to mobilize a grassroots lobbyist campaign on the Internet should not be underestimated.[36]

[36] Culnan, Mary J., "An Issue of Consumer Privacy..." **The New York Times** 31 Mar 1991: Section 3, 9.

2.2. Caller Name Identification (a.k.a. Caller ID): A Decade in the Making (1987–1997)

Bell Atlantic first introduced caller ID in New Jersey in 1987. A decade later the feature was slowly gaining acceptance. By the turn of the 21st century, Caller ID had become one of the most popular telephone services, second only to Call Waiting in many states.[37] Caller ID's current popularity raises the question, why did it take so long to gain public acceptance? The answer can be found in the decade-long battle between telephone companies and privacy advocates.

[37] "A Million Consumers Can't Be Wrong," Caller ID Product-Market Campaign, PR case on file at Fleishman-Hillard.

2.2.1. A Decade of Protest

Immediately upon Caller ID's introduction, the product received considerable protest, particularly from Computer Professional for Social Responsibility and their director Marc Rotenberg, those same privacy advocates who had successfully protested Lotus MarketPlace's launch. Rotenberg testified before numerous courts and committees, speaking out against Caller ID for many of the same reasons he has spoken out against Lotus Marketplace and would later speak out against the Pentium III PSN; the technology at hand identified individuals and revealed personal information about them without their explicit consent. However, with Caller ID, Rotenbeg and his associates were able to approach the protest from an even more effective angle than they had approached MarketPlace. Due to government regulation of telephone services and privacy laws already in effect, privacy advocates could attack Caller ID from a legal standpoint. In one of his many court appearances, Rotenberg cited a transfer of control of personal information (telephone number), much as in the Lotus case, from consumer to company. He states, "Caller ID essentially transfers control of the disclosure of the number to the telephone company. The company then either sells the number to the call recipient or requires that the call originator take extra steps to protest the disclosure of the number."[38] Rotenberg was speaking out against the very trend Davies described earlier.[39] Caller ID is an excellent example of privacy rights that have been converted into consumer issues, where the consumer must increase his/her expenses in order to enjoy more privacy. When Caller ID was first introduced back in 1987, per-call blocking, or the ability to block one's number from being identified on a per-call basis, had been offered, often at an additional per-call cost, to those who wished to remain anonymous. To use the service, customers had to enter a code prior to making any call they wanted to be anonymous. Privacy advocates protested this "opt-out" measure as insufficient and unfair. Not only did per-call blocking literally force the customer to pay for privacy, but also was poorly advertised and not even offered in some states, such as New Jersey.[40] Many phone companies claimed that simply the existence of per-call blocking was counterproductive to the aims of the Caller ID technology; it defeated the purpose and reduced the utility of the feature.

[38] Rotenberg, Marc, Direct Testimony before the State of Vermont Public Service Board, July 17, 1991, **http://www.cpsr.org/cpsr/privacy/communications/caller_id/cpsr_testimony_vt_cnid_hearing_1991.txt**

[39] Davies, 144

[40] Sullivan, Ronald, "Caller ID Arriving for Phone Customers in Parts of Manhattan and the Bronx," **The New York Times** 5 Apr 1993: B3

In the spring of 1990, a definitive action on the legality of Caller ID came from Pennsylvania where the American Civil Liberties Union (ACLU) had filed a lawsuit. The Pennsylvania Supreme Court ruled that Caller ID violated the state's wiretap laws as well as the state's constitutional right to privacy. This ruling reversed a previous decision by the Pennsylvania Public Utilities Commission to allow Caller ID. The court was not swayed by the opt-out of "blocking" either, arguing, "Caller ID, either in its blockable or unblockable format, violates the privacy rights of the people of this commonwealth."[41] The Pennsylvania decision generated considerable attention nationwide, but not all states followed Pennsylvania's lead. By 1991 Caller ID was available in more than twenty states, while being considered in thirteen others.[42] Yet, due to the controversy and poor publicity that Caller ID was receiving, the feature was not very popular among customers. In New Jersey where Caller ID had first become available, less than 6% of eligible

[41] DeCew, 156

[42] DeCew, Judith Wagner, **In Pursuit of Privacy: Law, Ethics, and the Rise of Technology** (Ithaca: Cornell University Press, 1997) 153.

customers had opted for the feature by spring of 1992.[43] The situation had reached a stalemate. Privacy advocates continued to press for a concrete, default "opt-out" feature, phone companies maintained that such a feature would defeat the purpose of the technology, and consumers weren't buying in.

[43] Ramirez, Anthony, "Caller ID: Consumer's Friend or Foe?" **The New York Times** 4 Apr 1992: Section 1, 52.

2.2.2. An Acceptable Solution

It took nearly ten years, but telephone companies finally came up with an acceptable solution for Caller ID. By 1995, companies in Massachusetts and New York were offering customers a choice of either per-call blocking or per-line blocking, at no extra charge. By 1996, the FCC (Federal Communications Commission) had gotten involved, passing regulations that required phone companies to offer per-call blocking and allow per-line blocking as long as state policy allowed it as well.[44] Per-line blocking, or the ability to block one's number from being released on all calls made from that phone line, was the opt-out that most privacy advocates had been asking for during the entire debate. Yet, it took until the mid-nineties for telephone companies to realize that such a compromise did not defeat the purpose of their technology, but rather gave them the marketing device they needed for the technology to take off. By offering per-line blocking, telephone companies were able to ease the public's fear that they would be "trapped" in this new technology with no choice. A strong marketing campaign to educate potential customers on the realities of Caller ID, including their ability to "opt-out" with per-line blocking, then both increased visibility of the technology and made the public more comfortable with it. Through compromise and customer education, phone companies were able to successfully turn a heated privacy issue into a matter of customer choice.

[44] DeCew, 158

Customers were now left with few negatives to the Caller ID feature. They had the ability to easily and completely prevent their number from appearing on others' telephones, while still retaining the ability to see the numbers of incoming calls. The situation experienced by Pacific Bell in California provides an excellent example of what happened around the country as Caller ID slowly gained acceptance and popularity. In 1997, after a year in release, only 20% of customers had subscribed to Caller ID. The low subscription rate was in a large part due to a massive education campaign that had portrayed Caller ID as a technology that sharply violated privacy. Through a bit of research, Pacific Bell came to the conclusion "that the primary barrier to subscription was a lack of understanding about the service."[45] Thus, Pacific Bell set out to provide their customers with the correct information, distributing free Caller ID service and display units to employees and among the media. A year later, in December of 1998, the service's popularity had skyrocketed, increasing to 1.2 million subscribers from less than 200,000 in July of 1997.[46]

[45] "A Million Consumers Can't Be Wrong"

[46] "A Million Consumers Can't Be Wrong"

The results were the same across the country, only differing in timetables. During the mid to late nineties, Caller ID gradually won over state after state, eventually making itself indispensable to a new style of telephone use. A 1996 **Washington Post** article commented on "increasingly common changes in phone behavior, thanks to a recent doubling in the popularity of the two services in the Washington area…Two million, or 17 percent, of Bell Atlantic's 12 million customers in six states and the District use Caller ID, compared with 1 million in June 1995."[47] By 1996 Caller ID had taken off in Washington, overcoming privacy concerns despite being in CSPR's backyard. Bell Atlantic, the telephone company in Washington, attributed the feature's delayed success to a heavy marketing campaign (as would be used by Pacific Bell in California a year later) as well as highly visible consumer benefits.[48] While Caller ID had "long been criticized for chipping away at phone users' privacy…those who use the new technology argue it can enhance privacy by giving people more control over whom they talk to and when. They talk of screening out zealous telemarketers, guarding family time and even checking the honesty of friends and acquaintances."[49] The utility of Caller ID was unquestionable, particularly in today's world where time is an increasingly valuable commodity. As a Bell Atlantic spokeswoman explained, "[Caller ID] gives people control. It gives them information that allows them to decide how they're going to handle a call."[50] By marketing Caller ID as a technology that gives control rather than takes it away, telephone companies were able to successfully overcome considerable opposition and launch one of today's most popular telephone technologies.

[47] O'Hanlon, Ann, and Mike Mills, "Now, Anyone's Got Your Number; Caller ID, Return-Call Services Changing Area's Phone Habits," **The Washington Post** 5 Jul 1996: D1

[48] O'Hanlon, D1

[49] O'Hanlon, D1

[50] O'Hanlon, D1

2.3. Pentium III Processor Serial Numbers: Losing a Number, Saving a Name (1999)

On January 20, 1999 at the RSA Data Security Conference in San Jose, an Intel Corporation executive announced his company's plans to incorporate embedded serial numbers in their Pentium III series of microprocessors.[51] These processor serial numbers (PSNs) would uniquely identify a user's computer on the Internet and in relation to software applications. These announcements ignited heated controversy and protest among privacy advocates who feared that such a number's extensive tracking ability would all but eliminate anonymity on the Internet. Within a week Intel was backpedaling, reversing their intention to ship the chip with the PSN activated. By April of 2000, Intel was conceding defeat to the privacy advocates; "We made the decision earlier this year…. We are not planning for (the chip ID) in our next processor," reported an Intel spokesperson.[52]

[51] Thomas, Owen, "May I see your CPU, please?" **Red Herring** 20 Jan 1999 **http://redherring.com/insider/1999/0120/news-inteldongle.html**

[52] As qtd. Lemos, Robert, "Intel disables ID tracking in new chips," **ZDNet News** 26 Apr 2000 **http://zdnet.com.com/2100-11520265.html**

2.3.1. Security and Privacy: The PSN Tradeoff

The planned PSN technology had a number of potential benefits. A serial number would provide verification of an online identity (by connecting computer to e-consumer to credit card and address information), thereby reducing fraud and making online transactions more secure. By verifying identity, the PSN would have been able to prevent software piracy by allowing software to only be installed or run on verified computers. It would also have provided a means to trace stolen chips or CPUs. Finally, a PSN would aid in preventing "overclocking" or the running of chips at higher speeds than Intel intended, and then selling them for greater profit.[53] Unfortunately, rather than playing up the last few benefits, all of which would have appealed strongly to Intel's customers, Intel marketed the PIII PSN with a large emphasis on the improvements it would mean for e-commerce security. Such security came at a price. As one spokesman for Intel, admitted, "There are two elements here: Security and privacy…Security is inherently good, but at the cost of some privacy."[54] Privacy advocates feared that by uniquely identifying someone's computer, that person's online browsing habits, unbeknownst to him/her, would be extensively tracked and profiled by both the websites being visited and by third parties compiling target marketing databases. This would lead to unwanted solicitations and a destruction of the anonymity that makes the Internet so appealing.

[53] Zeichick, Alan, "Big brother inside: should you care?" **Network Magazine** May 1999: Vol 14, Issue 5, 112.

[54] As qtd. Lemos, Robert, "Intel: Privacy is our concern as well," **ZDNet News** 19 Jan 1999 **http://zdnet.com.com/2100-11-513454.html**

2.3.2. Big Brother Inside

These concerns were brought to the attention of both the government and the public by privacy advocacy groups such as the Electronic Privacy Information Center (EPIC) and Internet savvy tech-lobbyists, most notably one named Junkbusters. On their website, Junkbusters asserted, "Intel's proposal to put a unique ID code inside of every computer it sells will significantly reduce the level of privacy available to computer users around the world. The unique code will make possible far more extensive tracking and profiling of individual activity, without either the knowledge or consent of the user."[55] Such tracking and profiling scared groups like EPIC and its director, former CSPR director, Marc Rotenberg, for many of the same reasons as Lotus MarketPlace and Caller ID. The Internet, like the telephone, was widely regarded upon its inception as a forum where one could maintain anonymity. By revealing one's identity to any website that read the PSN, Intel's technology essentially took control of personal information away from the consumer. In response to the launch, EPIC organized and advocated a boycott of all Intel products. A massive online protest began, revolving around the website **www.bigbrotherinside.com**. By linking the PSN with the Orwellian fear of a completely transparent society, **www.bigbrotherinside.com** was able to create an effective image that catered to the public's technological ignorance. While the general public may not understand the technical intricacies of "overclocking" and online identity verification, they do understand and fear the image of a "Big Brother" knowing what websites they are visiting.

[55] Clausing, 2

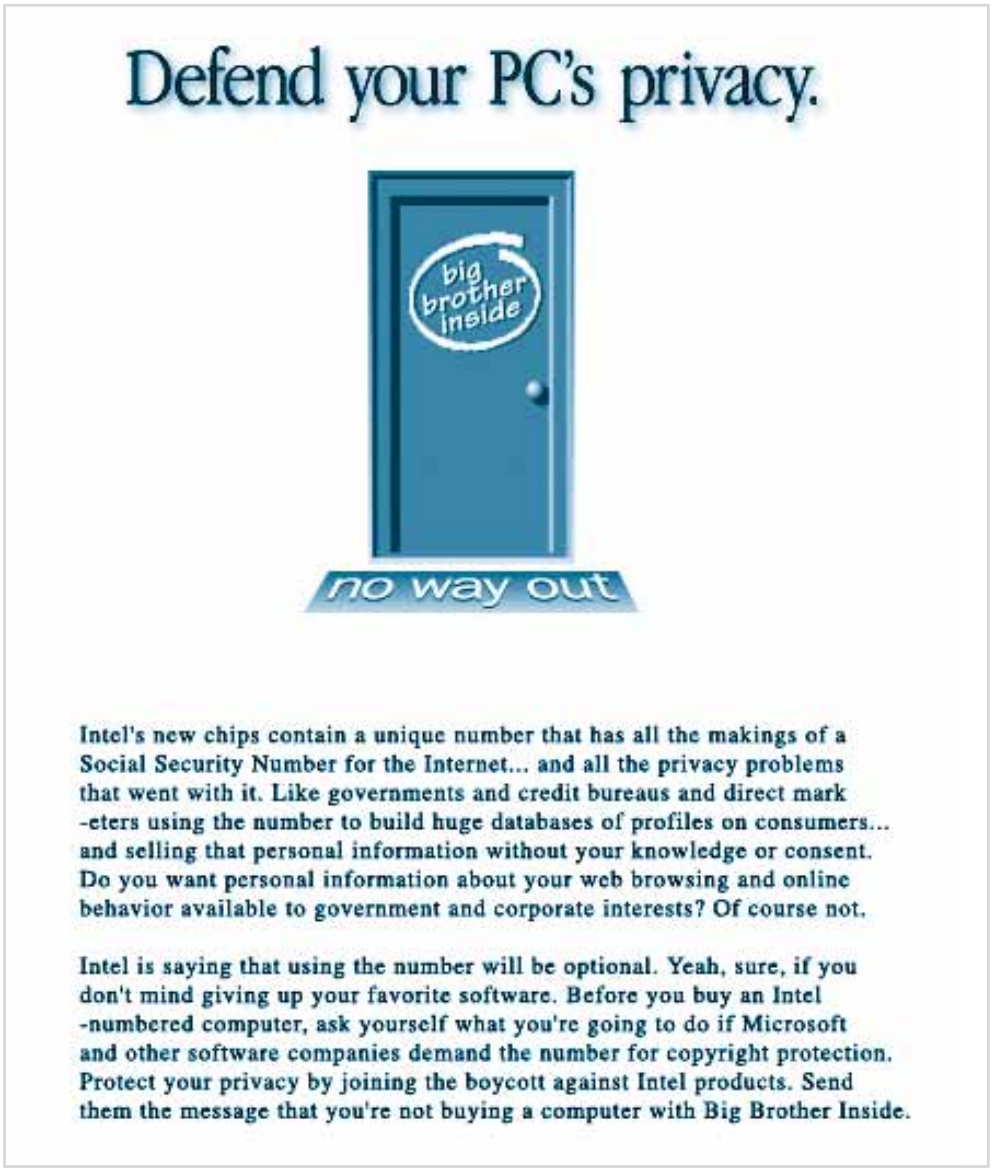


Figure 2: www.bigbrotherinside.com distributed pamphlets like this one to promote their boycott of Intel products. Note the allusions to Orwell, the emphasis on no opt-out, and the clever reworking of Intel's "Intel Inside" logo.

[56] Clausing, 2

The immediate and violent protest over Pentium PSNs brought the PIII chip to the attention of policy makers in Washington. One such policy maker, Edward J. Markey (D-MA), a member of the Energy and Commerce Committee's Subcommittee on Telecommunications and the Internet, was prompted to write a letter on January 22, 1999, just two days after the announcement in San Jose, to Intel's chief executive. The letter asked that the corporation take measures "to better balance both commercial and privacy objectives."[56] The Center for Democracy and Technology also took action, filing a complaint with the Federal Trade Commission.

[57] Lemos

Intel claimed that there were a number of safeguards in place to ensure that the PSN would not be misused or invasive. They asserted that "companies that intend to track a chip's ID number will have to notify a user that they are doing so. In addition, the PC chip giant will provide a software patch that will turn off the function and restore anonymous browsing to the user."[57] Intel maintained that, consumers had a potential opt-out via a software patch and theoretically would be able to avoid companies' sites where they had been notified that their computer was being tracked. However, this opt-out was seen as

being potentially irrelevant after a few years due to another major critique of the PSN, the fear that it would ultimately become the ubiquitous method of identity verification. Many consumer advocates were afraid that eventually companies would make verifying customer identity (via PSN) a required piece of doing business with online consumers, thereby refusing business to anonymous users.[58]

[58] Lemos

While EPIC and Junkbusters were stirring up the public about the potential loss of the Internet as an anonymous forum of communication, there were many who disagreed with the severity of the privacy advocates' charge. While Jason Catlett, president of Junkbusters Inc. asserted, "[Intel's PSN technology] changes fundamentally the assumption people have that they are anonymous when their computers are connected to the Internet."[59] On the other hand, many claimed that such an assumption was naive to begin with. One PSN supporter countered, "Hogwash. Nobody is anonymous on the Web…Web servers log each user's IP address. Most users accept 'cookies' specifically designed to identify them in the future… Internet privacy is already rare, and Web anonymity nonexistent."[60] Such supporters accused the protesters of exaggerating the problem. Wrote one such supporter, "The privacy zealots and the misinformed politicians do us all a disservice with their conspiracy theories. I think we should focus instead on encouraging and using the technologies that will make it easier to customize our own privacy and security options."[61] However, these voices of support for the PSN were relegated to the background as fear of Big Brother and news of the Intel boycott spread through the press and the public. Ultimately caving to heavy government, interest group, and consumer pressure, Intel announced on January 25, 1999 that they would not be shipping the Pentium III chips with the serial number activated. Rather, they would have the number disabled by default, but with the option for the user to turn it back on.[62] Intel's action prompted Rotenberg to respond in the New York Times, "It looks like we won Round 1… [but] It's a temporary fix…It can be just as easily disabled as enabled. There's not enough assurances here that the chip will not be misused."[63]

[59] as qtd. Hayes, Frank, "Just a number," **Computerworld** 1 Feb 1999 **http://www.computerworld.com/printthis/1999/0,4814,33787,00.html**

[60] Hayes

[61] Johnson, Maryfran, "Big Brother brouhaha," **Computerworld** 1 Feb 1999 **http://www.computerworld.com/printthis/1999/0,4814,33834,00.html**

[62] Clausing, Jeri, "Intel alters plan said to undermine PC users' privacy," **The New York Times** 26 January 1999: A1

[63] As qtd. Clausing, 1

2.3.3. Hacked

In late February a German computer magazine proved just how easily that misuse could occur, announcing that it had hacked the serial number and could turn it on even after it had been turned off on the BIOS level. The worst fears of most privacy advocates had been confirmed. The magazine known as **c't** (which stands for Computer Technology) reported that its processor expert had found a procedure to read the serial number via software, even after it had been switched off.[64] Responded one privacy advocate, "It looks like a pretty serious flaw. It's been one disaster after another for Intel. It was inevitable that someone would discover how to do something like this. All of Intel's claims that people's privacy was going to be protected was built on a house of sand."[65] Intel acknowledged that **c't's** method would effectively read the serial number but "questioned why anyone would want this data and noted that the serial numbers are intended to assist IT managers with asset tracking, information management and security."[66] According to technology experts, access to serial numbers such as PIII's PSN do not pose a large security threat, particularly when Internet Protocol addresses typically uniquely identify a computer and its user in today's world where cable modems, LANs, and Ethernet are fast replacing dial-up as the primary form of accessing the Internet (dial-up access randomly assigns an IP address to your computer whereas Ethernet based connections usually have a static IP). In November of 1999, as Intel was slowly deciding to abandon the idea of PSN altogether, the controversy still flared in Europe where an advisory group (the Science and Technology Options Assessment Panel) to the European Parliament recommended that the government ban the PIII from sale in Europe because of privacy concerns.[67] A few months later, Intel had moved away from trying to incorporate a PSN into their PIII processors in any form whatsoever.

[64] Persson, Christian, "Pentium III serial number is soft switchable after all," **c't** May 1999.

[65] as qtd. Kahney, Leander, "Privacy Hack on Pentium III," **Wired News** 23 Feb 1999 **http://www.wired.com/news/print/0,1294,18078,00.html**

[66] as qtd Harrison, Ann, "Pentium III Hacked, But Still Shipping," **Computerworld** 1 March 1999 **http://www.computerworld.com/printthis/1999/0,4814,34760,00.html**

[67] D'Amico, Mary Lisabeth, "EU group mulls banning Pentium III," **Computerworld** 29 Nov 1999 **http://www.computerworld.com/printthis/1999/0,4814,29529,00.html**

2.3.4. Avoiding a "Public Relations Nightmare"

While Intel's PSN technology failed, neither Intel nor their Pentium line of chips suffered tremendously in the long run. By maintaining a dialogue with their consumers and listening to the privacy issues with their product, Intel was able to salvage their reputation, if not their plan for embedded serial numbers. As an Intel supporter explained, "Intel moved swiftly to turn a public relations nightmare into a story

about customer choice. The $26 billion chipmaker reversed its position and pledged that the Pentium III would ship with the security feature turned off. That leaves it up to customers to turn it on if they want and additional layer of identification hard-wired into their machines."[68] Giving the consumers a default opt-out and leaving a good deal of choice in their hands created a better relationship between consumer and corporation than had been exhibited by Lotus with MarketPlace. It was this communication and compromise that enabled Intel to survive a boycott, strong online protest, and even the hacking of their PSN with their good name intact.

[68] Johnson

2.4. Cellular Phones: Avoiding a Scare (1992 – Today)

Cellular telephone technology, introduced in Tokyo, Japan in 1979, made its stateside debut in Chicago in 1983. For the rest of the 1980s, cellular phones remained expensive, obtrusive, unseemly pieces of equipment used only by a select portion of the population who, either for business or pleasure, enjoyed the convenience of having a phone with them at all times. As cellular technology entered the 1990s, phones became cheaper, smaller, and more widespread, particularly for use in automobiles. Today, cell phones are nearly ubiquitous, even prevalent among middle-school aged children. However, the acceptance of cellular telephone technology was far from a smooth progression from introduction to success. Rather, cell phones have faced, and nearly succumbed to, harsh criticism and rampant public fears concerning their effects on human health and the safety of their use.

2.4.1. The Great Cell Phone Scare

On April 8, 1992, David Reynard of St. Petersburg, Florida, filed a lawsuit against the manufacturer, seller, and service provider of his wife's cellular car phone.[69] The lawsuit alleged that "a brain tumor, which killed his wife, was caused or aggravated by radiation emitted by her NEC Corp. cellular car phone."[70] Thus began the "great cell phone scare." In late January of 1993, Reynard appeared on Larry King Live and aired his allegations to the entire nation. Shortly thereafter, cell phone users across the country filed similar suits. In the wake of intense media attention, cellular phone company stocks slid 10 to 15% and cell phone sales declined.[71] Following the lawsuit filed by Reynard public fears brought the issue of cell phones and cancer to the attention of both Congress and the FCC. Both vowed to look into the radiation issue, "with the FCC indicating it will probably adopt lower radiation-level guidelines, which would lead to a reevaluation of cellular equipment."[72] In light of the "public hysteria" Rep. Edward Markey (D-MA), chairman of the Subcommittee on Telecommunications and Finance requested information on current standards for radio frequency radiation to be given to Congress by the FCC and held hearings on the issue.[73] Gradually fears declined as the media grew disinterested and scientific evidence failed to support Reynard's and others' claims. Yet, in 1998 fears escalated again due to rumors of new scientific studies that showed links between cell phones use and brain cancer. Now, nearly a decade after the first "great cell phone scare" and few years after the most recent concerns, cell phones are fast becoming ubiquitous. Today, "The FDA tells consumers that 'available science does not allow us to conclude that mobile phones are absolutely safe or that they are unsafe.'"[74] Yet, despite such lack of conclusion, cell phone sales have skyrocketed, with estimates nearing 500 million phones in use worldwide last year.[75] How could a technology in the face of such violent controversy and seemingly on the verge of succumbing to public hysteria have succeeded on such a grand scale?

[69] Goldberg, Robert B., "The Cellular Phone Controversy: Real or Contrived?" **EMF Health Report** (Vol 1., No. 1: 1993) **http://infoventures.com/emf/hrpt/v1/v1n1ms.html**

[70] Eckerson, Wayne and Ellen Messmer, "Users not jumping gun on cellular phone, cancer link," **Network World** 8 Feb 1993: Vol 10, Issue 6, 17.

[71] Goldberg

[72] Eckerson, 17

[73] Eckerson, 17

[74] Dollemore, Doug, "Cell Phone Safety News," **Prevention** Mar 2002, Vol 54, Issue 344.

[75] Flynn, Julia, with John Carey & Roger Crockett, "More Sound and Fury Over Cell Phones: Do they cause brain tumors? An exhaustive study is on the way," **Business Week** 26 Jan 1998: 35.

2.4.2. Svelte Fashion Items

First, over the past decade, the benefits of a cell phone have become increasingly visible to the consumer. Phones have become "svelte fashion items" that serve as symbols of status, power, independence, and convenience in today's world.[76] Cell phones provide a viable alternative to traditional landlines often with more advantages, such as mobility, increasingly inexpensive rates (particularly for long distance), and a number of built in features, including voicemail, text messaging, caller ID, voice activated dialing, games, alarm clock, and the Internet. In some respects, the cell phone has become more personal assistant than

[76] "Dial F for Fear," Editorial, **NewScientist.com** 10 Apr 1990 **http://www.newscientist.com/hottopics/phones/phones.jsp?id=21810100**

personal accessory. In 1993, discarding your phone or deciding not to go wireless due to health concerns was an easy decision. Phones were cumbersome pieces of equipment that often proved to be a nuisance in public places. Contemporary cell phones cater to their users specific desires in terms of size, features, and calling plans, making themselves indispensable, particularly when the concerns with them are not readily visible.

Second, cell phone companies were poorly prepared for the initial controversy that would ignite in reaction to Reynard's 1993 lawsuit. For the most part, they assumed that compliance with existing safety guidelines would satisfy the public. Ronald Nessen, Vice President of Public Affairs and Communications of the Cellular Telecommunications Industry Association voiced his disbelief the explosion of concern; "I thought when [the media] looked at this information they would see this was a law suit with an unsubstantiated charge… What a mistake." The problem was that the phone companies had not publicized their own research so as to assure the public that Reynard's claims were, in fact, unsubstantiated. When fears again escalated in 1998, due to published studies that supposedly showed links between brain cancer and cell phones use in laboratory mice, the companies were prepared, having poured money into research efforts and public relations campaigns to ensure their consumers that their concerns were being listened to and that the products they were using were safe. On their current website, Nokia (**www.nokia.com**) assures visitors, "Accepted scientific fact does not support the allegations of possible links to harmful health effects…Nevertheless, at Nokia we are responsive to our customers' concerns about mobile phone safety. That is why through contributing to high quality research programs globally, we support the development of better scientific and public understanding of these issues."[77] Motorola has an entire pamphlet downloadable at their website (**www.motorola.com/rfhealth/brochure.pdf**), complete with simplified language that explains complicated terms such as Specific Absorption Rate and Non-ionizing radiation in a manner easily understood by even the least techno-savvy of readers.

[77] "Health and Mobile Telephony," **Nokia http://www.nokia.com/safety/**

2.4.3. A Change in Tone

A year and a half after Reynard sparked controversy and concern with his lawsuit, the Scientific Advisory Group on Cellular Telephone Research, commissioned by the Cellular Telecommunications Industry Association, released an detailed plan for more than $2 million worth of laboratory tests and studies focused on the potential link between cell phones and brain cancer.[78] These studies have yet to yield concrete data backing up claims of heath risks associated with cell phone use and it is the cell phone companies that are pouring in the money to fund them. A 1998 **Business Week** article reported, "Most of the evidence to date shows what many people assumed after the first scare died down: Wireless phones don't pose a major heath hazard. Certainly Motorola, Ericsson, Nokia, and others in the $37 billion mobile-phone business, which has spent millions to underwrite research into the subject since 1993, are hopeful that the project and other research now under way can put to rest the issue of cell-phone safety."[79] By listening to their consumers' fears and putting money into scientific efforts to quell them, cell phone companies have successfully changed the tone of the scientific and public opinions surrounding cell phones. While consumers' apprehensions with a new technology they did not understand used to be fueled by scientific studies showing "potential" links to cancer, they are now calmed by the comments of confident scientists and radiation experts. "We believe the risk is nonexistent," claimed one such expert doing research at the Medical College of Wisconsin.[80] In fact, the public is becoming increasingly callous to the cancer concern as demonstrated by the fact that a recent editorial on **NewScientist.com** likened the health effects of a cell phones to those of a hair dryer.[81] By presenting a new technology with ever-increasing consumer benefit, listening to and acting on consumer concerns, thereby neutralizing them, and communicating with consumers in a language they can understand, cell phone companies were able to launch an incredibly successful technology that is revolutionizing the way humans interact.

[78] O'Shea, Dan, "Research Group to study cellular/cancer link," **Telephony** 5 Sep 1994: Vol 227, Issue 10, 15.

[79] as qtd. Flynn, 35

[80] as qtd. Dollemore, 44

[81] "Dial F for Fear"

2.5. Genetically Modified Food: Caught in a Rubber Band (1993–Today)

Biotechnology has been one of the fastest growing industries over the past ten years. It has also been the source of great controversy, media attention, and scientific debate. Large corporations such as Monsanto, DuPont, Syngenta AG, and BASF, among others, have been pouring money into developing agricultural biotechnology for nearly twenty years. When genetically engineered crops first appeared in the early 1990s, they did so primarily without public knowledge of their use. The first crops were engineered to resist pests, thereby reducing the cost of insecticides and labor required to spray crops. Scientists effectively "cloned the gene that codes for the toxin in a spore-forming bacterium called **Bacillus thuringiensis** (Bt) and inserted it into the biological makeup of tobacco, tomatoes, cotton, and other plant crops."[82] These crops proved popular with farmers who could save money and increase yield through using them, yet the public was more or less unaware that such crops were becoming available. As Travis Brown, a former executive with Monsanto said during our interview, "You can have very successful technology running underneath public radar for quite sometime."[83] However, the very fact that the technology was running underneath public radar is what ultimately presented problems for Bt, and numerous other agricultural technologies.

[82] Rifkin, Jeremy, **The End of Work: The Decline of the Global Labor Force at the Dawn of the Post-Market Era** (New York: G.P. Putnam's Sons, 1995) 120.

[83] Brown, Travis, Interview, 6/13/02

2.5.1. A Rubber Band Effect

Agricultural Biotechnology companies enjoyed an explosion of popularity and success as more farmers, excited about potential savings and greater yields, purchased genetically engineered crops. Monsanto, whose herbicide Roundup was already quite popular among farmers already, developed new genetic strains that were resistant to Roundup and could be injected into plant seeds. They hoped to "market both the patented seeds and the herbicide together as a single package."[84] With this technology ready for launch, Monsanto was at the forefront of the biotech movement and its success. Brown admits that Monsanto had not consulted the public or taken potential "fear factors" into consideration. "[Monsanto] wasn't consumer friendly, that's not why they succeeded," he remarked.[85] Monsanto had seen farmers as their customers and had put all their efforts and investments in marketing their products to them, instead of looking down the supply chain to the end user of their technology, the "regular folks" who would eat the genetically engineered foods yielded by these modified seeds. At first there were no apparent problems with such an approach, but then agricultural biotechnology arrived in Europe. According to Brown, Monsanto was not depending on the European market for financial success and had taken for granted that their products would succeed there, as they had in the US.[86] Due to a more consumer aware atmosphere in Europe, perhaps a result of recent "mad cow" scares, a number of fears surfaced with the genetically modified food that was produced by these reengineered crops. Immediately public interest groups were calling for labels to appear on genetically modified foods, and, similar to the "great cell phone scare," scientific reports were showing proposed links between genetically modified foods and all sorts of ailments and illnesses.

[84] Rifkin, 120

[85] Brown, Interview, 6/13/02

[86] Brown, Interview, 6/13/02

The protests in Europe received considerable press, causing US advocates to stand up and take notice. The Center for Science in the Public Interest (CSPI) got particularly involved in protesting genetically modified foods. As the issues surrounding agricultural biotechnology received more and more press in the US, consumers started to become concerned. While genetically modified food had remained a successful technology while "under public radar," the lack of public knowledge on the subject now worked to biotech companies' collective disadvantage. Cynthia McCafferty, a Vice President in the Public Affairs department of Public Relations firm Fleishman-Hillard, noted that there was "no strong effort to educate the public" on the part of these companies.[87] By having no voice in the protest, companies like Monsanto allowed their protesters to speak for them, as had happened with Lotus back in 1990. Brown acknowledged, "Someone other than you will define the problem if you don't…and will come up with their own solution."[88] The solution for groups such as CSPI was, in the absence of a complete ban on genetically modified food, to have extensive labeling on such food. Suddenly US consumers were being bombarded with all sorts of negative information concerning agricultural biotechnology and due to their own ignorance; they were unable to separate the misinformation from the legitimate concern.

[87] McCafferty, Cynthia, Interview, 6/13/02

[88] Brown, Interview, 6/13/02

Now biotech companies were faced with a severe problem, their end user consumers were starting to protest their products, causing a rubber band effect to come back to the companies' direct consumers, farmers. Clearly farmers did not want to invest in products that the public feared and their own customers would not buy.[89] Sales of genetically modified products and the stocks associated with the companies that produced them slid heavily in the late 1990s while food companies like McCain Foods, McDonald's, and Wyandot requested that their suppliers refrain from delivering gene-altered products.[90] A spokesman for Wyandot Inc. acknowledged his desire for genetically modified food to succeed, but admitted that the decision was not in his hands; "I think this could be such a benefit and such a boon to mankind, but people are just blinded by their fear."[91] Biotech companies' responses to these fears were far from adequate. Unlike cell phone companies, who released a great deal of information in relation to radiation concern in language their consumers could understand, biotech companies maintained a technically superior attitude. McCafferty remarked, "Language is a problem [with genetically modified food]."[92] For example, the names of agricultural biotechnology products, Bt corn and Bovine Growth Hormone are not nearly as savvy as "Frankenfood," a term coined by protesters and seized by headlines. Aside from having a particularly unappealing name, Bovine Growth Hormone also exhibits some of the major problems that emerged with marketing a genetically modified food to the end user.

89 Brown, Interview, 6/13/02

90 Chase, Brett, "Gene-altered seeds facing resistance; Some firms don't want them," **Chicago Sun-Times** 27 Aug 2000, 45.

91 as qtd. Chase, 45

92 McCafferty, Interview, 6/13/02

2.5.2. Starting a Food Fight with Ben and Jerry: The Case of BGH

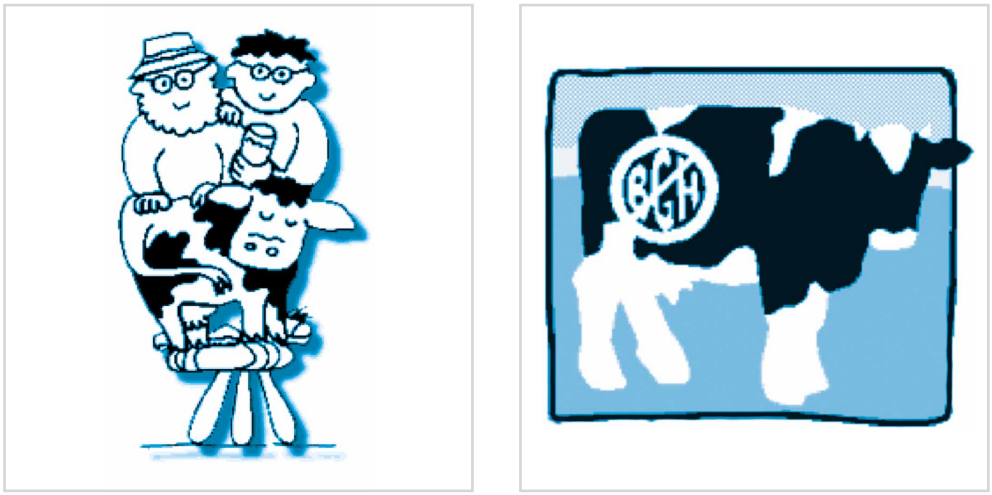
In 1993 the FDA approved Monsanto's Bovine Somatrotopin, popularly known as Bovine Growth Hormone (BGH). In 1994, Monsanto released the product for sale to dairy farmers around the US. The product was a growth-stimulating gene that could be injected into cows, enabling them to produce between 10 and 20 percent more milk.[93] Brown remarked that BGH was not intended to be the big biotech breakthrough that it was portrayed to be in the media, it just happened to be one of the first biotechnology products that was ready for the market at that time. Activists jumped on BGH as a harbinger of harmful, "unnatural" products to come. The product ran into enormous health issues, particularly with children, as uninformed but easily impressionable mothers did not like the idea of giving their families an unnatural product that might harm them.[94] Popular ice cream maker Ben and Jerry's strongly protested BGH, stating on their website, "As we see it, Genetically Engineered Bovine Growth Hormone (rBGH) is a step in the wrong direction toward a synthetic, chemically intensive, factory produced food supply." [95] As a company whose homegrown, natural image was central to their popularity, Ben and Jerry's did not like the idea of large corporations taking away the livelihood of local dairy farmers and replacing their natural product with a chemically synthesized one. Ben and Jerry's launched a lawsuit in order to gain the right for their suppliers to label their product as "anti-rGBH." Initially the FDA had forbidden such a label, claiming that the genetically engineered milk was the same as milk from non-GBH injected cows, but in 1997 Ben and Jerry's won a legal settlement and dairy farms were allowed to label their product.[96]

93 Rifkin, 120

94 Brown, Interview, 6/13/02

95 "We're Starting a Food Fight," **http://www.benjerry.com/bgh/index.html**

96 "We're Starting a Food Fight"



Figur 3 & 4: Ben and Jerry have effectively portrayed themselves as friends of the cow and of all things natural in their protest against BGH.

2.5.3. "Cultivating a New Image"

Recently, biotech companies have been "Cultivating a New Image."[97] Perhaps it is too late, but many companies are launching massive PR and education campaigns to explain biotechnology to the end user consumer and demonstrate its usefulness. A website (**www.whybiotech.com**) has been set up by the Council for Biotechnology Information, a coalition of companies such as BASF, Monsanto, and DuPont, to provide such information.[98] Currently, biotechnology companies are setting up charitable foundations, backing aid for subsistence farmers, and donating data and patents as part of a PR campaign to gain acceptance for GM food.[99] By emphasizing the revolutionary ability of their technology to curb world hunger and alleviate malnutrition in third world countries, biotech companies are hoping that their consumers will see agricultural biotechnology in a while new light. Monsanto again has been at the head of the pack in this respect; "After encountering resistance in Europe and criticism around the world, Monsanto Co. started the trend two years ago by giving away a trove of genetic data on the rice plant that might improve a staple consumed by many of the world's poor."[100] The change in tact has had some positive results. While "Opposition to genetically modified food remains intense," a recent **Washington Post** article reports that "many publicly funded researchers, once deeply skeptical of the companies' intentions, are impressed enough by the recent efforts to reconsider some of their views." [101] An important test will come this fall when Monsanto splits from parent company Pharmacia.[102] Depending on how Monsanto's stock is received, the industry may or may not have seen its fortunes reversed.

[97] Gillis, Justin, "Cultivating a New Image: Firms Give Away Data, Patent Rights on Crops," **Washington Post** 23 May 2002: E1.

[98] **http://www.whybiotech.com**

[99] Gillis, E1

[101] Gillis, E1

[102] Gillis, E1

3. CONCLUSION

In examining these five technologies, a few patterns stand out as to what failed and what succeeded. Caller ID and Cellular Phones, the two success stories, had clearly visible consumer benefit and an ability to opt-out which, whether utilized or not, eased public fear. Furthermore, in each case a strong PR and educational campaign, conducted in a language the public could understand, played a vital role in the technology's success. In the cases of Lotus MarketPlace and Genetically Modified Food, a lack of participation in the protest cost the companies involved dearly. In both of those cases, as well as the case of Pentium PSNs, flat out ignorance or disregard of consumer concern proved costly, as did a stubborn refusal to compromise once that concern was realized. In fact, it was similar refusal to compromise that cost Caller ID a good five to ten years before it was finally adopted. A change in tone and eventual attempt to compromise saved Intel's reputation and their Pentium line. It has yet to be seen whether a similar change can help the agricultural biotechnology industry. It is interesting to note that in most of these cases, the protest was originated by consumer advocacy groups such as CPSR, EPIC, Junkbusters, the ACLU, and CSPI, rather than by the "regular folks" themselves. Only after consumers, fueled and often educated by these groups, expressed concern, did the government get involved. It is evident that many of the major players in these cases, people such as Marc Rotenberg, Mary Culnan, Rep. Edward Markey, etc., need to be involved in such technical launches from the beginning stages. These people and their organizations represent the consumer concern that eventually emerges with a new technology and, as illustrated in the cases here, can play large roles in preventing its adoption. Therefore, maybe it is not David Brin's "regular folks" that companies should look out for and look to for answers, but rather the organizations that represent these "regular folks" and who initiate the protest for them that are the valuable resources when launching a new technology. At the very least, it is quite clear that communication is of the highest importance. If a dialogue is not maintained between a company and its consumer in a language that the consumer understands, that consumer can easily fall victim to misinformation or exaggerated fears. Some technologies to watch in the near future that are currently facing concerns would include biometric ID chips such as the Verichip, the acceptance of Smart Cards within the US (Smart Chips on Credit Cards are already widely in use in Europe), the progress of genetic engineering, and the fate of Internet Databases. The successes and failures that result, the limits that are set, and the public concerns that are voiced will shape the technological boundaries of our future.

APPENDIX: LOTUS' RESPONSE

The following are excerpts from Lotus' January 3, 1991 post to comp.society:

In response to recent messages that have appeared here about Lotus MarketPlace, we want to provide some hard facts that we hope will clear up some of the misinformation surrounding our product….

…. Lotus MarketPlace: Households is a CD-ROM database of names and addresses on U.S. consumers, which businesses use for direct marketing. It is a small—but highly visible—part of a multibillion direct marketing industry that helps businesses deliver products and services to interested consumers through compiled lists and databases.

Some people argue that the information collected in Lotus MarketPlace: Households should not be available. However, this information is already readily available, either as a matter of public record or through thousands of other commercial lists and database sources. For example, the 1990 Boston Yellow Pages alone lists more than 50 mailing list brokers….

…. In developing MarketPlace, Lotus and Equifax Marketing Decision Systems have implemented a number of controls that go far beyond traditional industry practices for consumer privacy protection. Besides limiting the data to what is readily available as a matter of public record, Census data profiling, and similar sources most people can already access, we have taken three additional and important steps:

1) we are offering the product only to legitimate businesses;
2) we are providing consumers with an option to have their names removed from the database; and
3) we are educating and advising users of the proper legal and ethical responsibilities for list usage….

…. We hope that this clarifies any questions or concerns.[103]

[103] Gurak, 117–120

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