Chapter 1

Resistance is Futile? Reluctant and Selective Users of the Internet

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"Happy families are all alike; every unhappy family is unhappy in its own way." This famous opening line of Anna Karenina, suitably modified, might apply also to the study of the Internet and its influence on American commerce. It is relatively easy to describe the shared characteristics of those markets and industries that have readily embraced Internet technologies. We can do so using the seemingly imperative logic of economic rationality: reduced transaction costs, efficient distribution channels, disintermediation, economies of scale and scope. Understanding why some users and industries might resist the Internet, or at least adopt it reluctantly or selectively, is more difficult. It requires us to consider a much larger, more complex, and often idiosyncratic set of motivations, rationales, and structures. Which brings us back to Tolstoy: although we can fruitfully generalize about the reasons that the Internet has succeeded, its failures require us to tell more particular stories about specific industries, professions, and users.

Of course, talking about resistance to the Internet in terms of "failure" is misleading. There is a constant temptation, when studying the adoption of new technologies, to categorize potential users as either "sages" or "Luddites"—those who have the foresight

and the courage to embrace new technologies, and those who do not.[1] Such simplistic dichotomies are rarely intellectually productive. The dismissal of reluctant users of technology as being ignorant, recalcitrant, or backwards is a rhetorical strategy, not an analytical device.[2] Recent scholarship in the history of technology has shown that most users respond selectively to new technologies, embracing those aspects that they find appealing or useful and rejecting those that they do not.[3] In fact, the study of resistance, rejection, and other "failures" is often a most valuable tool for understanding the larger process of technological innovation: the negative response of users to new technologies often reveals the underlying assumptions, values, and power-relationships that are embedded in those technologies.[4]

All this being said, however, the rapid and widespread adoption of the Internet in the past decade, its seemingly ubiquitous presence in American business, and the apparently inexorable march of Moore's Law towards smaller, less expensive, and more powerful computing, makes talk of reluctance and resistance seem quaint and irrelevant. Perhaps there are a few groups that are not yet regularly online - the poor, the elderly, the technophobic - but the Internet is clearly becoming the dominant infrastructure for communications, commerce, and recreation. As James Cortada has suggested, for any business not to have a Web-presence or email address in today's economy would be like not having a Yellow Pages listing a decade ago.[5] There might be a few hold-outs, but the vast majority of businesses are either online or have plans to be.

And yet, even within a commercial landscape that has undeniably been transformed by Internet technology, we can identify, not just pockets, but vast territories in which reluctant users have successfully resisted technological innovations. In this chapter we will explore three major industries or industry groups in which the Internet has had limited or unexpected influence. These include the health care industry, higher education, and what I am calling indispensable intermediaries. These are not insignificant industries: health care, for example, is a $1.7 trillion industry that absorbs almost 15% of the American gross domestic product. Among my indispensable intermediaries are included such sales and service industries as automobile dealerships, residential real estate, and fashion retailing. My point is not that the Internet has had negligible influence on these industries, but rather that this influence has been highly mediated by the actions of reluctant users. These users have not rejected the Internet altogether, but

[1] Larry L. Morton, and Christopher J. Clovis,"Luddites Or Sages? Why Do Some Resist Technology/Technique in Classrooms?," *Simile* 2 (2002).

[2] Gregory C. Kunkle,"Technology in the Seamless Web:"Success" and"Failure" in the History of the Electron Microscope," *Technology and Culture* 36, no. 1 (1995): 80-103.

[3] Ruth Schwartz Cowan,"The Consumption Junction: A Proposal for Research Strategies in the Sociology of Technology," The Social Construction of Technological Systems (1987): 261-80.

[4] Nelly Oudshoorn, and T. J Pinch, eds. *How Users Matter : The Co-Construction of Users and Technologies*, vol. Inside technology (Cambridge, Mass: MIT Press, 2003).

[5] Cite Jim's chapter.

instead have adopted it selectively. University professors, for example, have embraced email, which serves their purposes well and fits neatly into established patterns of work and authority. On the other hand, they have proven extremely reluctant users of Web-based instructional technologies, which threaten their traditional control of the classroom environment. Physicians, on the other hand, regularly make use of the Web for research and educational purposes, but have rejected email in the context of their professional practices.

So what makes physicians like real estate brokers like automobile manufacturers like university professors? It is not entirely clear. Like Tolstoy's unhappy families, it is not their similarities, but their differences that make them interesting and deserving of further study. By reflecting on the ways in which very idiosyncratic professional, economic, and legal concerns shape the responses of these various groups and industries to emergent Internet technologies, we hope to introduce additional nuance and historical specificity into a conversation that has long been dominated by technological or economic determinism.

The E-Health Revolution

Telemedicine. Telehealth. Health informatics. Interactive health communications. Electronic medical records. E-Health. From the late 1950s to the present, these various efforts to effectively integrate electronic computing and communications technologies have captured the imagination of visionaries, entrepreneurs, health care benefits managers, insurance companies, hospital administrators, public health officials, and government agencies - and to a lesser extent, patients and physicians. The appeal of these systems appeared self-evident to their promoters. Telemedicine would extend the reach of physicians and specialists into rural or otherwise underserved areas.[6] Expert systems promised to standardize medical practice and encourage better informed decision making on the part of physicians.[7] Interactive health communications tools could be used to educate patients, promote healthy behaviors, and manage demand for health services.[8] Health informatics, electronic medical records, and other forms of computerized medical data processing would increase efficiency and lower costs through enhanced oversight of practices, spending, and costs. And electronic communications networks would improve the quality of medical care for all by making possible vastly

[6] Marshall Ruffin,"Telemedicine: Where is Technology Taking Us?," *Physician Executive* 21, no. 12 (1995): 43.

[7] Bonnie Kaplan,"The Computer Prescription: Medical Computing, Public Policy, and Views of History," *Science, Technology, and Human Values* 20, no. 1 (1995): 5-38.

[8] T.R. Eng, and D.H. Gustafson, *Wired for Health and Well-Being: The Emergence of Interactive Health Communication.* vol. cience Panel on Interactive Communication and Health, US Department of Health and Human Services (U.S. Government Printing Office, 1999).

improved data sharing between patients, physicians, benefits providers, and medical researchers.[9]

Although each of these individual initiatives attracted some attention and garnered some successes, it is safe to say that prior to the 1990s these broader goals of integration, efficiency, cost-reduction, and improved access and care had not been achieved through the introduction of new computing and communications technologies. In recent years, however, the emergence of the Internet as a low-cost, high-speed, and widespread electronic communications infrastructure has prompted a resurgence of interest in medical computing. In fact, in the heady days of the late 1990s, no industry seemed as amenable to Internet-based transformation as the US health care industry. Not only was health care the single largest industry in the United States - $1.5 trillion in 1996 alone, as Wall Street analysts were fond of reminding potential investors - but it was also "the ultimate knowledge business".[10] Many of the most significant problems facing the industry were perceived to be informational in nature. As much of one-third of spending in health care was believed to be wasted shuffling paper between patients, providers, and third-party payers - waste that could be neatly eliminated by making such transactions electronic.[11] In addition, the combination of increasing costs, an aging population, and an apparently worsening shortage of nurses and certain medical specialists seemed to demand a more efficient allocation of scarce resources.

Under the broad umbrella of "e-Health" many of the earlier visions of telemedicine and health informatics have been resurrected as e-mail or Web-based services. E-Health systems would allow physicians and nurses to perform remote consultations, manage patient records, and process benefits claims via electronic clearing houses. Inexpensive web cams and digital cameras would be used to make high-quality specialist care available to the home-bound, isolated, and poor. Patients would be able to access health related information and records, communicate with physicians via email, participate in online support groups, and use the Web to make appointments, refill prescriptions, and purchase health care products. Within a "few years" the economies of scale of the Internet would ensure that "every physician will choose to connect his or her office to a community health information network based on the World Wide Web."[12]

By the turn of the 21st century, it appeared that an Internet-based transformation of American medicine was desirable, imminent, and inevitable. The rapid expansion of the Internet into other areas of life and commerce were cited as precedents for a

[9] Ibid.

[10] J. Goldsmith,"How Will the Internet Change Our Health System?," *Health Aff* 19, no. 1 (2000): 148-56

[11] Michael Lewis, *The New New Thing : A Silicon Valley Story*, 1st ed (New York: W.W. Norton, 2000).

[12] Marshall Ruffin,"Why Will the Internet be Important to Clinicians?Why Will the Internet be Important to Clinicians?," *Physician Executive Physician Executive Physician Executive* 22, no. 10 (1996): 53.

similarly rapid shift towards e-Health services: as one representative editorial in the New England Journal of Medicine predicted, "On-line, computer-assisted communication between patients and medical data bases and between patients and physicians promises to replace a substantial amount of the care now delivered in person."[13] Physicians would use email to treat common diseases and would provide highly customized Web-based services to patients. Some of these services would be provided by their in-house staffs, some by partnering with external "dot-com" providers.[14] Following this compelling dream of improved, efficient, and consumer-oriented health care, venture capital funding in health care in the late 1990s shifted rapidly towards Internet-based services, rising from $3 million in the first quarter of 1998 to $335 million by the fourth quarter of 1999.[15] In that year more than 21 e-Health startups went public - including Netscape founder Jim Clark's Healtheon, whose initial valuation topped $1 billion. Clark predicted that within a few years Healtheon would control $250 billion of the $1.5 trillion health care industry.[16]

And yet despite massive investment in e-Health initiatives by private firms, government agencies, and even medical professional societies, the e-Health revolution has been slow in coming. The predicted convergence on Web-based standards for the coordination and exchange of medical records, laboratory results, billing information, and patient outcomes has not happened, nor has the widespread use of digital cameras or video conferencing for patient monitoring. This is not to say the Internet has had no effect on health care practices. Eight out of ten internet users have accessed health information on the Web. The health information portal WebMD.com received 11 million unique hits in January 2006 alone.[17] Of these, almost 12% (17 million) report that the Internet played a crucial or important role as they helped another person cope with a major illness.[18] More than 97% of physicians use the Internet, many on a daily basis, for clinical research and communication.[19] In 2004 more than 423,000 physicians went online to pursue continuing medical education (CME) credit.[20]

Nevertheless, the overall influence of the Internet on medical practice has been remarkably—and quite unexpectedly— limited. With the exception of information gathering, prescription refilling, and the occasional purchase of health-related equip-

[13] Kassirer, NEJM 1995.

[14] Jerome Kassirer,"Patients, Physicians, and the Internet," *Health Affairs* 19, no. 6 (2000): 115.

[15] James Robinson,"Financing the Health Care Internet," *Health Affairs* 19, no. 6 (2000): 72.. See also Michael Lewis.

[16] Michael Lewis, *The New New Thing : A Silicon Valley Story*.

[17] Arlene Weintraub,"Will Webmd's Healthy Glow Last?," *Business Week Online Business Week Online Business Week Online* (2006): 13-13.

[18] Pew Survey (same one?)

[19] V.K. Podichetty, et al.,"Assessment of Internet Use and Effects Among Healthcare Professionals: A Cross Sectional Survey," *Postgraduate Medical Journal 2006* 82 (2006).

[20] http://www.allbusiness.com/periodicals/article/532690-1.html

ment, most patients do not, and cannot, access traditional medical services online. Many of the early entrants into the e-Health arena died in infancy or went bankrupt, the few survivors being forced to dramatically adjust their business plans to accommodate more traditional patterns of patient-physician interaction.

Why the slow and fitful adoption of Internet technologies in one of the nation's largest and most information-centric industries? The answer to this question is almost as complex as the health care industry itself, and illustrates the many ways in individual technological innovations, even one as seemingly ubiquitous and powerful as the Internet, cannot be fully understood outside of context of their larger socio-technical environment. The short answer, however, is that physicians, seemingly one of the principle beneficiaries of e-Health initiatives, have proven reluctant to adopt them as a tool for interacting with, diagnosing, or monitoring patients.[21]

The evidence of this reluctance is undeniable: the majority of physicians do not provide even basic clinical services, or even the means of scheduling appointments, over the Internet; fewer than 6% of all patients have reported ever having communicated with their doctor via email (a figure that has remained remarkably unchanged over the past decade)[22] ; of the 34% of physicians who do have a website, the vast majority are little more than "online business cards"[23]; only a small number of institutions support "telemedical" technologies for monitoring or follow-up care. The up-and-coming health care Internet turned out to be "vaporware", in large measure because skeptical physicians resisted its implementation.[24]

Explaining physician's resistance to Internet technologies is a little more difficult. After all, today's physicians are hardly opposed to technology on principle: physicians were early adopters of the personal computer as well as cell phones. Most physicians are actually highly Internet-savvy: 97% have Internet access, with 71% spending time online daily.[25] More than 90% of physicians use the Internet for medical research, and three-quarters for pursuing continuing medical education (CME) credit.[26] Modern medicine is for the most part exceedingly (perhaps excessively) high-tech, with new diagnostic and therapeutic technologies being introduced and adopted on a regular basis. Physicians' continued reluctance to embrace e-Health initiatives is clearly not

[21] Chan,"E-health fails to fulfill promise," American Health News, August 2000 see Guthrie for original cite. J.D. Kleinke,"Vaporware.Com: The Failed Promise of the Health Care Internet," *Health Affairs* 19, no. 6 (2000).

[22] Speilberg, 1998, #16991; V.K. Podichetty, et al.,"Assessment of Internet Use and Effects Among Healthcare Professionals: A Cross Sectional Survey."

[23] http://www.physiciansweekly.com/pc.asp? issueid=54&questionid=60

[24] J.D. Kleinke,"Vaporware.Com: The Failed Promise of the Health Care Internet."

[25] V.K. Podichetty, et al.,"Assessment of Internet Use and Effects Among Healthcare Professionals: A Cross Sectional Survey."

[26] http://www.allbusiness.com/periodicals/article/532690-1.html

a result of latent neo-Luddism, an inability to learn new technologies, or a result of insufficient access or training.

One obvious explanation is a lack of economic incentives: in the current third party payer system, physicians are rarely reimbursed for Internet-based activities. This is certainly a powerful disincentive. And yet reimbursement is rarely cited by physicians as their principal reason for avoiding the internet. Rather, concerns about privacy, liability, and patient safety and well-being are described as being primary.[27] Even allowing for a certain degree of calculated disingenuousness on the part of physicians, it seems clear that more than just economic factors have influenced their collective wariness of Internet-based medicine. A more complete and satisfying explanation of their behavior requires that we situate the history of physician resistance to the Internet in a larger economic, legal, professional, and ethical context. Doing so allows us move beyond the simplistic economic and technological determinism that often dominates discussions about the history and future of Internet commerce.

Telemedicine

The influence of technological innovation on medical practice in the past century cannot be overstated. The introduction of new clinical tools for diagnosis and therapy and of new instruments for scientific and biomedical research, the development of mass production techniques for pharmaceutical production, widespread improvements in sanitation, transportation, and public health infrastructure, and even the development of new survey and advertising technologies have all significantly shaped the burgeoning 20th and 21st century health care industry. One of the unintentional side-effects of the increased significance of technology in medicine, however, has been the centralization of medical practice around sites of technological innovation and capital investment: hospitals, laboratories, and specialized diagnostic treatment centers.[28] This process of centralization and specialization has, in turn, led to problems of access and resource distribution, particularly among rural populations, the poor, and the elderly.

In order to counter the centralizing effects of high-tech, capital-intensive medicine, hospitals, medical schools, and government agencies began experimenting, in the late 1950s, with the use of information and communications technologies aimed at expanding the reach of medical practitioners. These systems of "telemedicine" - quite literally "medicine at a distance" - allowed physicians to use telephone, videoconferencing, and remote control technology to consult with colleagues and patients in remote areas. In 1959, for example, a group of psychiatrists at the University of Nebraska Medical Center

[27] Tom Ferguson,"Digital Doctoring - Opportunities and Challenges in Electronic Patient-Physician Communication," *JAMA* 280): 1361-62.

[28] Stanley Joel Reiser,"Medical Specialism and the Centralization of Medical Care," in *Medicine and the Reign of Technology* (Cambridge ; New York: Cambridge University Press, 1978).

made use of a campus-wide interactive television network to link groups of off-site patients with on-site psychiatrists. Finding little difference in therapeutic efficacy or patient satisfaction between "real" and "virtual" consultations, they introduced, in 1965, a production telepsychiatry system that linked via microwave the psychiatrists in Omaha with patients at the Norfolk State Mental Hospital, 112 miles distant.[29] Funded by a grant from the National Institutes of Mental Health, the program lasted for six years and logged 300 hours of clinical telepsychiatry sessions.

Over the next several decades telemedicine programs, typically funded through grants from government agencies, were tested in medical schools, state psychiatric hospitals, municipal airports, jails, nursing homes, and Native American reservations.[30] For the most part these systems were used to provide high quality or specialist medical services to rural or otherwise remote areas. Although a broad definition of telemedicine did not imply the use of any particular communications medium - telephones, fax machines, radio, or even the conventional postal system could all serve as mechanisms for the provision of services - in the United States the focus has historically been on interactive video, which often required participating sites to install fixed, studio-quality video equipment.[31] The high cost of such equipment - as much as $50,000 per installation, even as recently as 1995 - limited the applicability of telemedicine and necessitated a "hub-and-spoke" topology that linked rural or otherwise remote area with an urban tertiary care center. Patients were still required to travel to suitably equipped medical centers, and the "real-time" demands of video-based telemedicine meant that the valuable time of consulting physicians had to be carefully coordinated in advance.

Perhaps because of this bias towards videoconferencing, or because much of the funding for experimental telemedicine came from NASA and the Department of Defense - both agencies having a particular interest in providing medical care to otherwise inhospitable or inaccessible areas - the focus of telemedicine research has been on the provision of access where it was otherwise not available, rather than on cost-effectiveness.[32] In 1997 a Department of Commerce study showed that despite there being more than 150 telemedicine sites in 40 states, only 5000 patients were being treated remotely using telemedicine technologies.[33] The majority of telemedicine

[29] C.L. Wittson, et al.,"Two-Way Television in Group Therapy," *Mental Hospitals* 12 (1961).; L. Baer, et al.,"Telepsychiatry At Forty: What Have We Learned?," *Harvard Review of Psychiatry* 5 (1997): 7-17.

[30] Jim Grigsby, and Jay Sanders,"Telemedicine: Where it is and Where It's Going," *Annals of Internal Medicine* 129, no. 2 (1998): 123-27.

[31] Mary Gardiner Jones,"Telemedicine and the National Information Infrastructure: Are the Realities of Health Care Being Ignored?," *Journal of the American Medical Informatics Association* 4, no. 6 (1997).

[32] NASA and the Department of Defense had a particular interest in providing medical care to otherwise inhospitable or inaccessible areas, and provided hundreds of millions of dollars in funding for telemedicine.

[33] Department of Commerce, Telemedicine Report to the Congress, January 13, 1997.

occurred within a very limited set of medical problem domains: radiology, cardiology, orthopedics, dermatology, and psychology, in that order.[34] These were specialties that were either image- or interaction-oriented, had traditionally used technology to operate at a distance, and, perhaps most importantly, whose remote contributions had been approved for reimbursement by most major third-party benefits providers. In any case, the broader promise of telemedicine for providing more mundane services on a cost-effective basis remained unrealized.

The emergence of the Internet as a more economical architecture for electronic communications promised an opportunity to transform telemedicine from "treatment-option-of-last-resort" into the mainstream of contemporary medical practice. Not only was the Internet a lower-cost and more widely available network infrastructure for delivering telemedical services, but its "store-and-forward" architecture helped solve the second most pressing problem for telemedicine: namely, the difficulties inherent in coordinating the activities of multiple, very busy medical specialists. Instead of requiring these specialists (and their patients) to always gather together for "live" video consultation, physicians could gather lab results, radiological images, patient histories, and other medical records, and forward them to a multimedia consultation "folder" that a specialist could examine at her leisure. The specialist would add her interpretation to the growing folder, and a notification would be sent to the primary physician. Not only was this electronic mediated system of store-and-forward faster and less expensive than shipping physical documents, but it did not require either physician to be present on a live television screen.[35]

The potential of the Internet reinvigorated the telemedicine community. As early as 1995 NASA, along with private companies such as Inova Health Systems, began experimenting with pilot programs that used personal computers, inexpensive videocameras (webcams in today's parlance), and MBONE (Multicast Backbone), an experimental, videoconferencing-oriented subset of the Internet.[36] In 1996 the National Library of Medicine announced the award of nineteen multi-year telemedicine projects intended to serve as models for:

- Evaluating the impact of telemedicine on cost, quality, and access to health care;
- Assessing various approaches to ensuring the confidentiality of health data transmitted via electronic networks;
- Testing emerging health data standards.

[34] Ibid.

[35] Marshall Ruffin,"Telemedicine: Where is Technology Taking Us?"

[36] Ibid.

These projects moved beyond the traditional tools and problem domains of telemedicine to include information dissemination, chronic disease management and home care services, systems for the management of patient records, and the use of "home-based personal computers connected to the National Information Infrastructure."[37]

The use of a public network to transmit medical information raised questions about security and privacy, however, as well as concerns about a potential "digital divide" in access to Internet-based health care. While in 1997 more than one-third of all American household had home computers, less than 15% were connected to the Internet. In addition, access to computers varied greatly by race, gender, and socio-economic status: fewer than 10% of people with an annual income of less than $10,000 had home computers, only 1–2% of which were networked, while two-thirds of Americans with incomes over $75,000 had home computers, 60% of which were networked.[38] Unfortunately, the former were the underserved population most in need of the benefits provided by telemedicine. And even the fortunate few with Internet access suffered from the "last-mile" problem that limited the speeds at which they could connect to network services.

The principle problem confronting telemedicine - in the early years of the Internet as well as today - was not technological, however, or even economic.[39] The problem was not even with patients, or patient access to the Internet. The real problem was the physicians. Outside of a small group of specialists, physicians have proven extremely reluctant to embrace Internet-based telemedicine. In order to fully understand this reluctance, and the many reasons for its persistence, it is necessary to first describe the fate of a second Great Hope of Internet-based medicine: namely, e-mail.

Email

The practice of medicine has always been limited by geography; that is to say, by the ability of physicians to have physical access to patients. Traditionally this required the movement of physicians, travel in the pre-automobile era being too stressful or dangerous for patients. Physicians were therefore always generally willing to adopt new technologies of transportation and communication. This became particularly true during the 19th century as medicine became increasingly specialized, dependent on complex (and immobile) equipment for diagnosis and therapy, and centralized around the hospital. The growth of cities, the emergence of railroad networks, and

[37] "Secretary Shalala Announces National Telemedicine Intiative", press release,National Library of Medicine (October 8, 1996).

[38] Mary Gardiner Jones,"Telemedicine and the National Information Infrastructure: Are the Realities of Health Care Being Ignored?". Should I find the original source of this and rewrite?

[39] Although the initial cost of video-based telemedicine was quite high, there is evidence that overall cost savings could be achived.

the introduction of the telegraph enabled individual physicians to practice medicine over large territories while still maintaining their ties to hospitals and other physician specialists.

As Alissa Spielberg has suggested in her insightful analysis of the use of email in patient-physician communication, the invention of the telephone in 1876 and its rapid integration into community and regional networks "marked a radical change in patient access to individual physicians."[40] Physicians were early adopters of the new technology. The first telephone exchange connected several Connecticut physicians to a central drugstore. Individual patients used the telephone to contact physicians in emergencies. Increasingly they expected immediate telephone access to their physicians, even in non-emergency situations. An 1878 advertisement from one physician noted that "his patients and the public that he may be summoned or consulted through the telephone either by night or day."[41] While this ready access was perhaps a boon to some physicians and their patients, it could also become a burden. Some physicians felt that they were becoming "slaves" to their anxious patients. They also expressed concern about privacy (a very real problem in the age of party lines and operator-assisted calls), reimbursement, a decline in professional standing, and the possibility that the telephone would lead patients to forego necessary physical examinations and possibly even cause themselves harm by "misinterpreting muffled prescriptions." In response to these concerns, physicians began using the telephone more strategically, relying on intermediates to screen calls and assess their priority, and declining to provide diagnosis based solely on phone-based information. Nevertheless, the ability of patients to interact with physicians over the phone from their own homes dramatically altered the nature of the physician-patient relationship, bringing with it increased expectations of access, immediacy, and privacy.

It is in light of this longer historical tradition of patient-physician communication that we can best understand the physician response to the growing popularity of email. The readiness of physicians to embrace the telephone as a tool for communication with patients has not been mirrored in their response to email technology.[42] Given the low-cost, simplicity, and ubiquity (particularly among physicians) of email, resistance to it is perhaps the most unexpected and seemingly inexplicable aspect of a larger pattern of resistance to Internet technologies.

At first glance it seems that the use of email for patient-doctor interaction simply represents a sub-set of the larger topic of telemedicine. And using the broadest definition of telemedicine—the use of information and telecommunications to support

[40] Alissa Spielberg,"On Call and Online: Sociohistorical, Legal, and Ethical Implications of E-Mail for the Patient-Physician Relationship," *JAMA* 280 (1998).

[41] The telephone. BMJ. 1878;2:43. Cited in Spielberg1998.

[42] Dean Sittig, et al.,"A Survey of Patient–Provider E-Mail Communication: What Do Patients Think?," *Internation Journal of Medical Informatics* 61, no. 1 (2001): 71-80.

medicine at a distance—this would indeed be true.[43] But as we have seen, in the United States at least, telemedicine acquired in practice a very specific, and constrained, set of social and technological meanings: video rather than text-based, dependent on expensive equipment and trained personnel, and as such limited in use to highly-paid specialists rather than general practitioners. Electronic mail, on the other hand, was the most widely available, easy to use , and familiar of the new Internet-based technologies. While not every patient had access to the Internet, the vast majority of those that did had access to email, even if they did not have a permanent or broad-band connection.

The use of email in medicine was widely lauded in the popular and professional press for having "revolutionary" potential for restructuring traditional relationships in health care.[44] The low cost and ready availability of email promised to open up new channels of communication between all participants in the system: physicians, patients, benefits providers, hospitals, and pharmacies. Email would make physicians more accessible, and the intimate nature of the medium would strengthen relationships between them and their patients.[45] At the same time, the asynchronous nature of email would allow physicians to balance their workload and respond more thoughtfully to patient queries. Evidence suggested that patients might be more willing to discuss via email sensitive topics that they might otherwise avoid in person.[46] And by reducing the prevalence of unnecessary office visits, over- and under-booking appointments, and playing phone tag, the use of email offered to reduce direct and overhead costs, personal frustration, and possibly even medical errors. Patients could potentially use email to book appointments, obtain test results, ask minor follow-up questions, request repeat prescriptions, and submit charts for monitoring chronic conditions.

In fact, email offered as much in terms of comfortable continuity as radical change: for patients and physicians already accustomed to communicating via telephone, email seemed to offer incremental improvements to traditional medical care. Patients still had to work within the context of the third-party payer system, and despite having access in theory to a wide range of service providers and consultants, in reality most email-based consultations would still have to be routed through their primary-care physician. And since these physicians had long been accustomed to interacting with their patients via telephone, it seemed quite natural that they would transition readily to email. Anecdotal evidence suggested that using email did not significantly increase a

[43] Marilyn Field (ed), *Telemedicine: A Guide to Assessing Telecommunications in Health Care*, Institute of Medicine, National Academy Press, 1996.

[44] Jerome Kassirer,"The Next Transformation in the Delivery of Health Care," *New England Journal of Medicine* 332 (1995): 52-54.

[45] Alissa Spielberg,"On Call and Online: Sociohistorical, Legal, and Ethical Implications of E-Mail for the Patient-Physician Relationship."

[46] Millstein SG, Irwin CE Jr. "Acceptability of computer-acquired sexual histories in adolescent girls." *Journal of Pediatrics 1983 103(5):815-819*; Borowitz SM, Wyatt JC. "The origin, content, and workload of e-mail consultations." JAMA. 1998;280:1321-1324.

physician's workload or reduce the number of in-office patient visits.[47] And yet despite all this, physicians have consistently refused to communicate with patients via email.[48] At no point during the past decade has the rate of email interaction between physicians and patients increased beyond 6%.[49] This despite the fact that national surveys show that as many as 90% of respondents would "welcome the opportunity to communicate with their doctors by email," with 37% indicating that they would be willing to pay for such access.[50]

So why have physicians not yet taken to email? Most frequently cited are concerns about privacy, liability, maintaining standards of care, and being overwhelmed by a deluge of new work.[51] The more cynical answer is that they have not yet figured out how to get paid for it. Reimbursement has been a traditional problem for telemedicine. Prior to the late 1990s, private benefits providers rarely had specific policies about paying for telemedical services. The Medicare program did cover some services that did not require face-to-face contact, such as radiology (which explains in large part radiology's prominent historical role in telemedicine initiatives). Although the 1997 Balanced Budget Act changed the reimbursement situation somewhat, it is still not clear where electronically mediated consultations fit into traditional reimbursement schemes.

Since the economic argument against using email has such a powerful reductionist appeal, it is worth examining in some detail. There is no question that in a health care system dominated by third-party benefits providers the reimbursement policies of these providers, private or public, have an enormous influence on the practice of medicine.[52] Physicians make decisions about which patients to accept, which tests to order, and which therapies to prescribe based on what insurance providers are willing pay for. And it is not clear that these providers have much incentive to cover telemedical services of any sort, particularly email-based services that would be widely accessible, broadly applicable, highly likely to be utilized, and difficult to monitor.[53] It is true that in 1999 the provisions of the 1997 Balanced Budget Act that increased coverage for telemedicine under Medicaid went into affect, but these provisions applied only to patients in federally-designated rural Health Professional Shortage Areas (HPSAs),

[47] Green L. A better way to keep in touch with patients: electronic mail. Med Econ. 1996;73:153.

[48] Paul Starr,"Smart Technology, Stunted Policy: Developing Health Information Networks," *Health Aff* 16, no. 3 (1997): 91-105}

[49] Dean Sittig, et al.,"A Survey of Patient–Provider E-Mail Communication: What Do Patients Think?"; Tom Delbanco, and Daniel Z. Sands,"Electrons in Flight – E-Mail Between Doctors and Patients," *N Engl J Med* 350, no. 17 (2004): 1705-07.

[50] Josip Car, and Aziz Sheikh,"Email Consultations in Health Care: 2 - Acceptability and Safe Application," *BMJ* (2004).

[51] Ibid.

[52] Dena Puskin,"Telemedicine: Follow the Money," *Online Journal of Issues in Nursing* Sept 20 (2001).

[53] J.D. Kleinke,"Vaporware.Com: The Failed Promise of the Health Care Internet."

and deliberately excluded "store-and-forward" systems of participation.[54] Only consultations in which a patient was "present" (via videoconferencing) would be eligible. In addition, although under the new system fees were split 75–25 between the consulting and referring physician, the accounting systems used by the Health Care Financing Administration (as of 2001, the Center for Medicare and Medicaid) was incapable of handling split payments. Participating physicians would only receive a portion of the reimbursement, but would be liable for tax and auditing purposes for the total fee.[55]

The situation improved somewhat with the passage, in late 2000, of the Medicare, Medicaid, and SCHIP (State Childrens' Health Insurance Program) Benefits Improvement Act (BIPA), which became effective October 1, 2001. BIPA greatly expanded coverage to include all non-metropolitan statistical areas, and included in its definition of telemedicine not just professional consultations, but also office and outpatient visits, medication management, and individual psychotherapy. It also eliminated fee splitting. It did not, however, explicitly include store-and-forward systems such as email, with the exception of two federally-funded demonstration programs in Alaska and Hawaii.[56] It also did not address some of the liability and licensure issues posed by telemedicine.

Although the rules for reimbursement as they apply to email and other telemedical systems are complicated and constantly changing, the lack of clear guidelines does appear to have an inhibiting effect on their use in clinical practice. This is particularly true of email, which often serves as a supplement to more traditional office visits or treatment regimes, as part of what are generally categorized as "case management" activities. The activities include time spent on pre- or post-service patient management, coordination of care, and follow-up. Unless these case management services involve (well-documented) high level medical decision making, they can be difficult to bill through to third-party payers.[57]

And herein lies the rub: although it appears from the above evidence that it would be obvious that physicians would avoid using email out of purely economic reasons, the same basic economic argument could also be used against the use of the telephone, a technology that physicians do use extensively. This is particular true of pediatrics, where as much as 20% of all clinical care, and 80% of all after-hours care, occurs over the telephone.[58] And yet pediatricians, as well as most physicians generally, have reconciled themselves to the fact that time spent on the telephone, although often not directly billable, is an important component of providing high-quality medical care, maintaining patient relationships, and balancing workloads. And, as was mentioned

[54] Rural HPSAs generally suffer from a shortage of primary care providers.

[55] Dena Puskin,"Telemedicine: Follow the Money."

[56] Ibid.

[57] Sanford Melzer, and Steven Poole,"Reimbursement for Telephone Care," *Pediatrics* 109 (2002): 290-93.

[58] Ibid.

earlier, the available evidence suggests that email interactions do not take more time or result in fewer office visits than do telephonic consultations. For those physicians participating in HMOs or other programs whose patients are insured under capitated contracts, avoiding office visits actually has a positive economic benefits.[59] Other physicians are implementing mandatory "administrative" or "access" fees to cover otherwise un-reimbursed services such as email or telephone consultations.[60] The point again being that relying overmuch on economically determinist explanations can be misleading. It seems clear that physician aversion to email cannot be explained purely in terms of reimbursement. When the lack of direct economic incentives is combined with other factors, however, such as legal and moral ambiguity, or concerns about status and authority, then this aversion becomes much more explicable. When considered within a larger context of practice, patient-physician relationships, and legal and socio-technical systems, email represents much more extension of older technologies of communication.

One of the potential advantages of email over other forms of communication is that as a text-based medium it is inherently self-documenting; that is, by its very nature email becomes part of the medical record.[61] This seemingly innocuous feature of email differentiates it in fundamental ways from purely spoken forms of communication such as a telephone conversation, and has enormous implications for its use by physicians. Email does not only enable, but in fact demands, a more detailed, thoughtful, and guarded response than a telephone call generally permits.[62] This runs counter to the generally casual conventions of email communication. Whereas for patients email might appear impermanent and erasable, from the point of view of physicians they are permanent (often even when deleted) and, more significantly, legally discoverable documents.[63] For some physicians the unique legal status of email is a positive benefit, providing additional documentation that could be used to protect against malpractice suits.[64,65]

Because email correspondence automatically becomes part of a patient's medical

[59] Lee Green,"A Better Way to Keep in Touch With Patients," *Medical Economics* 73, no. 20 (1996): 153.

[60] Anonymous,"Access Fees: Worth the Risk? What to Charge?," *Medical Economics* 81, no. 14 (2004): 50.

[61] Tom Delbanco, and Daniel Z. Sands, "Electrons in Flight – E-Mail Between Doctors and Patients."

[62] Alissa Spielberg,"On Call and Online: Sociohistorical, Legal, and Ethical Implications of E-Mail for the Patient-Physician Relationship."

[63] Ibid.

[64] Ibid.

[65] For others, this additional degree of accountability and potential exposure makes email a risky proposition.

Doreen Mangan,"Save Time and Patients With E-Mail," *Medical Economics* 76, no. 13 (1999): 155-59., Alissa Spielberg,"On Call and Online: Sociohistorical, Legal, and Ethical Implications of E-Mail for the Patient-Physician Relationship."

record, it is also becomes subject to increasingly stringent requirements for privacy protection. Even prior to the passage of the Health Insurance Portability and Accountability Act (HIPAA) in 1996, which greatly extended the privacy rights of health care consumers, the burden to ensure patient confidentiality has always been borne by the record holder.[66] Under HIPAA, email messages that contain protected health information (PHI) - both incoming and outgoing - are required to be secured. What exactly constitutes PHI, or what technologies and procedures are necessary to protect this information, is unclear.[67] The HIPAA provisions for email went into effect in 2003.

Given that the Internet in general, and email in particular, are notoriously open and insecure, the HIPAA requirements poses particular challenges for physicians. There are, of course, powerful encryption systems available that could be used to ensure privacy and security. But encryption technologies have not yet been widely integrated into the email practices of the average Internet use. Requiring the use of cumbersome encryption schemes by patients seems to defeat the whole purpose of email. Nevertheless, under existing regulations, physicians who use email must take "reasonable precautions" to limit unauthorized access to electronic communications.[68] Needless to say, the phrase "reasonable precautions" is both legally and technically ambiguous, particularly as it applies to Internet-based commerce. The burden of deciding which precautions are appropriate, as well as the financial burden of implementing and administering them, appear to fall upon individual practitioners.

Closely related to the problem of privacy is the problem of authentication. How can a physician be reasonably certain that the person that they are communicating with via email is really who they say they are? How can a patient be sure that the person who responds to their email is really their physician, and not a nurse, or a physician's assistant, or an office manager, or even a complete stranger? Once again, it is possible to use technologies such as digital signatures to authenticate identity on the Internet. But the infrastructure for managing digital identities is not well developed, and unfamiliar to most users.[69] And even if online identities could be perfectly managed and authenticated, what would this imply for the work of medical practitioners? Physicians have traditionally managed their workloads using a variety of intermediaries. In the office the work associated with a patient visit is divided among the front-office staff who triage patients and gather information, nurses who perform routine evaluations and procedures, and the physician herself, whose actual interaction with the patient is generally quite limited. Even telephone contact can be

[66] Lawrence Gostin, "Health Information Privacy," *Cornell Law Journal* 80 (1995): 451-527.

[67] Janlori Goldman, and Zoe Hudson, "Virtually Exposed: Privacy and E-Health," *Health Affairs* 19, no. 6 (2000): 140.

[68] Alissa Spielberg,"On Call and Online: Sociohistorical, Legal, and Ethical Implications of E-Mail for the Patient-Physician Relationship."

[69] Lawrence Lessig, *Code, and Other Laws of Cyberspace* (Basic Books, 1999).

managed using a combination of answering machines or services, front-office staff, and nurses or physician's assistants. The unstructured nature of email (as opposed to, say, a paper-based form) makes automatic routing or processing difficult, and, in any case, the expectation is that an email address to a physician will be responded to by that physician and not his or her support staff. The wonderful convenience and directness of email communication does not lend itself well to the traditional division of labor within medical practice.

For all of these reasons and more, the use of email by physicians has not been widely adopted. What at first glance seems to be a straightforward progression from one set of communications technologies to another—a progression has occurred so naturally in other industries that it might reasonably expected to happen in the health care industry as well—turns out in practice to be much more complicated than most observers anticipated. In many ways email is a very different technology for physicians than it is for their patients or for other professionals. The characteristic features of email— its intimate and casual nature, asynchronous mode, text orientation, and general lack of security and authentication mechanisms—acquire new and professionally significant meanings in the context of medical practice. In terms of physician-patient communication, email is not a generic replacement for face-to-face encounters or even telephonic conversations: for these specific users in this specific context its specific characteristics are tremendously significant. Obviously many of these features are incidental, historically contingent, and even socially constructed. We can easily imagine email systems designed with different technological characteristics, operating in different legal and social contexts, embedded in different socio-technical and economic systems. But in the current system of clinical practice, third-party reimbursement schemes, privacy and medical malpractice legislation, and health care labor organization, email as its is currently configured is a technology of questionable utility. At the very least, physicians on the whole do not currently find it useful and productive, and as unlike many other users of Internet technologies, physicians are a powerful and well-organized group of users.

Medicine and the Web

The focus of this chapter is on the reluctant users of the Internet, and so my discussion of the health care industry has focused on individual physicians and their generally negative, or at least ambivalent, response to Internet-based telemedicine and email consultation. But there are other players in the health care industry, some of whom seem to have adapted readily to the Internet. The WebMD.com health portal, for example, was mentioned earlier as one of the success stories of the Internet-based e-Health revolution. In fact, the term e-Health was coined in the late 1990s as an umbrella term to describe the broad array of consumer and health care provider activities—including but not

limited to telemedicine and email communication—that make use of the Internet, particularly the World Wide Web.[70] In addition to capitalizing on the marketing buzz of e-Commerce, e-Health represents a shift in emphasis from the patient-physician relationship towards broader, industry-oriented systems and technologies, particularly those that linked business-to-business (B2B) and business-to-consumer (B2C).

In many ways the story of e-Health begins, and ends, with Jim Clark and his Healtheon startup. Clark, the founder of Silicon Graphics and co-founder of Netscape, was one of the media darlings of the Dot.com boom of the late 1990s. In 1996, after retiring from Netscape, while being treated for a blood disorder at a Silicon Valley hospital, Clark reflected on the inefficiencies inherent in the fragmented, rigidly bureaucratized and paper-based health care industry. Such a highly inefficient industry - particularly such a highly inefficient, $1.5 trillion industry - seemed the perfect candidate for Internet-based consolidation. As much as one-third of the "waste" in health care, he believed, could be almost immediately eliminated through the use of electronic clearinghouses.

Clark quickly drew a sketch of the various players in the health care market - patients, physicians, payers, and providers - and added in their midst a "magic diamond", the key intermediary that would link all of these entities together in a seamless web of Internet integration. That same year he founded Healtheon to play the role of magic diamond, and predicted that within a few years Healtheon would control $256 billion of the industry. Healtheon went public in 1998 - and immediately collapsed as a result of the bursting of the Dot.com bubble. The next year it tried again, and this time raised almost $1 billion in capital. In the first quarter of 2000, Healtheon lost $471 million.

Michael Lewis, in his book *The New, New Thing: A Silicon Valley Story*, ably tells the story of the rise and fall of Healtheon.[71] Lewis describes it as a story of technology-driven hubris: a group of entrepreneurs and investors, none of whom knows the slightest thing about the health care industry, take on the largest and most complicated bureaucratic system in the world, and fail miserably in the trying. His story is quite correct, as far as it goes. But Healtheon is unique in that it survived the Dot.com explosion. In 1999 it merged with WebMD (founded in 1998) to form Healtheon/WebMD, acquired several of its major competitors, and in 2005 was renamed Emdeon. Those of its competitors that it did not acquire either went bankrupt (for example, DrKoop.com, in 2002), or were left by the wayside (in 2006 the WebMD portal attracted nearly three times as many hits as its nearest competitor, Microsoft's MSN Health). Although at this point its business plan no longer resembled that of the original Healtheon, Emdeon had become a $1 billion business, the largest clearinghouse of medical claims, whose

[70] Vincenzo Della Mea,"What is E-Health (2): The Death of Telemedicine,").

[71] Michael Lewis, *The New New Thing : A Silicon Valley Story*.

customer base included 1,200 payers, 5,000 hospitals and 300,000 physicians.[72]

The success of WebMD.com and other health information portals seems to indicate that at least some elements of the e-Health program have succeeded. And indeed, recent surveys show that as many as 80% of all Internet users, particularly women, have used the Internet to research health-related topics. Users searched for information on specific diseases (66%), diet, nutrition, vitamins, or nutritional supplements (51%), health insurance (31%), alternative treatments or medicine (30%), environmental health hazards (18%), experimental treatments and medicines (23%), and Medicare or Medicaid (%11), among other topics.[73] Even more surprisingly, 58% reported using the Internet preferentially, meaning that they would use it before any other source, and only 35% said that they would look to a medical professional first.[74] In addition to doing research, users are participating in health-related support forums, purchasing health equipment online, and ordering pharmaceuticals.[75] Although there are debates within the medical literature about the accuracy and safety of Internet-based information sources, it is clear that the majority of Internet users access health-related information online.[76]

What is not so obvious, however, is whether or not the use of the Internet for health related research has fundamentally altered the structures or practices of the medical community. The WebMD Health division of Emdeon, for example, which runs the WebMD.com portal, although successful in relative terms, represents only a small fraction ($50.1 million) of parent company Emdeon's first quarter revenues ($339.1 million) for 2006. Some of its revenue came from advertising and subscription fees (following the purchase of Medscape in 2001, WebMD Health is now the leading provider of online continuing medical education for physicians). The majority of Emdeon's revenue, however, derives from its electronic claim clearinghouse and practice divisions, both of which are largely based on technologies acquired through purchase and which pre-date the World Wide Web. Contrary to popular belief (at least among e-Health enthusiasts), a large percentage of medical claims—45% of all commercial claims, 80% of Blue Cross, and 97% of all hospital claims to Medicare—were already being processed electronically long prior to the e-Health revolution.[77] They are just being processed using proprietary EDI (electronic data interchange) systems rather than the Internet.

[72] Southwick2004

[73] Pew Survey

[74] Joe Flower,"American Health Care, Internet Style.American Health Care, Internet Style," *Physician Executive Physician Executive Physician Executive* 30, no. 3 (2004): 69-71.

[75] Ibid.

[76] Alejandro Jadad, and Anna Gagliardi,"Rating Health Information on the Internet: Navigating to Knowledge Or to Babel?," *JAMA* 279, no. 8 (1998): 611-14. Anthony Crocco, et al.,"Analysis of Cases of Harm Associated With Use of Health Information on the Internet," *JAMA* 287, no. 21 (2002): 2869-71.

[77] J.D. Kleinke,"Vaporware.Com: The Failed Promise of the Health Care Internet."

There is, in fact, little incentive for any of the major players in the current system to open up access to outside parties via the Internet. As J.D. Kleinke has suggested, the real reasons that it takes so long for medical claims to be processed has nothing to do with whether or not they are processed electronically, but rather with the network of state and federal regulations, insurance provider regulations, and fraud and abuse protections such as anti-kickback and Stark self-referral laws that make human intervention into claims processing inevitable. "The obstacles to achieving _ long-sought integration," observes Kleinke, "have nothing to do with IT and everything to do with the modern health care system."[78] This is perhaps an overly cynical position, but it does highlight the legal and economic dimensions of healthcare reimbursement rarely taken into account by purely technologically-oriented "solutions".

In any case, the increased availability of health information on the Internet has not succeeded in opening up the marketplace for health related services. Most Americans receive health insurance through their employers, and have limited opportunity to choice between benefits providers. Within a given provider's network of physicians, consumer do have some semblance of choice, although this choice is constrained by the usual limits of availability, geographical distance, etc. In this sense the lack of widespread access to telemedicine and email consultations, and the physician's role in limiting such access, contributes directly to the larger stagnation of e-Health initiatives. If the value of e-Health is dependent on the existence of a robust network of services and information, the failure of individual elements of that network contributes to the failure of the entire network.

Concerns about privacy affect the potential users of e-Health networks, albeit for slightly different reasons than those that preoccupy physicians. A recent study of Internet users found that three-quarters are concerned about the privacy of their health-related data. 40% will not allow their own doctor online access to their medical records. 25% will not purchase or refill prescriptions online. 17% will not even go online to seek health information because of concerns about privacy.[79] A number of highly public instances of health providers - including Global Healthrax, Kaiser Permanente, and the University of Michigan Medical Center - inadvertently revealing sensitive patient data, along with even more numerous security breaches among e-commerce firms more generally, have only heightened concern about potentially lax privacy standards.[80] It is also not yet clear how, or even whether, the rigorous HIPAA standards that apply to physicians and other, more traditional medical providers apply to the middlemen of the e-Health network.

Finally, it is difficult, in constructing any sober prognosis for the future of e-Health,

[78] Ibid.

[79] Janlori Goldman, and Zoe Hudson,"Virtually Exposed: Privacy and E-Health."

[80] Ibid.

to avoid running up against the brick wall of the third-party payer system. The private third party benefits providers who pay for most medical care in this country have little incentive to rationalize or speed up claims adjudication. Like most insurance companies, they make money on the "float" - the pool of prepaid premiums that they invest prior to paying back out in claims.[81] In addition, the developers of proprietary information technology systems have no interest in moving towards open Internet standards that might threaten the "lock-in" value of their particular offerings. We have already seen that individual physicians have little financial incentive to - and strong legal and ethical arguments against - participating in e-Health networks. The only group with a compelling interest in e-Health services are entrepreneurial information technology firms and the pharmaceutical firms. In 2005 pharmaceutical industry spending on Internet advertising, directly targeted at the many users searching for information about specific diseases and conditions, rose 30% to $53.9 million, while spending on television advertising remained the same.[82] In a health care system whose "fundamental problems" already stem from "irrational consumer behavior, uneven patterns of utilization, and runaway costs", it is not clear if what, if anything, this very limited constituency for e-Health development implies for the future of the Internet and medicine.[83]

The Professor and the Internet

Of all the industries that have been fundamentally changed by the invention of the Internet, nowhere were these changes so early or so readily apparent as higher education. Universities were early adopters of the Internet, and indeed, many core Internet technologies were developed by, or at least for, academic researchers. Three of the first four original nodes of the ARPAnet, one of the precursors to the modern Internet, were located at universities.[84] Many of the key figures driving the development of the ARPAnet were university faculty.[85] These faculty, and their graduate students, were instrumental not only in defining how the ARPAnet, NSFnet, and Internet would be constructed, but also in shaping how it would be used. Email, file sharing, and the World Wide Web were all developed and popularized at academic institutions.[86] Until home broadband access became widely available, universities stood at the center of the

[81] J.D. Kleinke,"Vaporware.Com: The Failed Promise of the Health Care Internet."

[82] Arlene Weintraub, "Will Webmd's Healthy Glow Last?"

[83] J.D. Kleinke,"Vaporware.Com: The Failed Promise of the Health Care Internet."

[84] UCLA, UC Santa Barbara, and the University of Utah. The fourth was the Stanford Research Institute, which, although not itself a university, was an academic research institution in its own right.

[85] J.C.R. Licklider and Lawrence Roberts were on the faculty at MIT, Robert Taylor at the University of Utah, and Leonard Kleinrock taught at both M.I.T. and Stanford.

[86] Janet Abbate, *Inventing the Internet* vol. Inside technology (Cambridge, Mass: MIT Press, 1999).

Internet universe, and trained generations of software developers, entrepreneurs, and users.

Universities continue to serve as important centers of Internet activity. The vast majority of university students own their own computer (85%) and regularly go online (74%). Almost three-quarters use the Internet more than the library for studying and research. Students use the Internet to meet in virtual study groups (75%), socialize (95%), download music (60%), and entertain themselves (78%). Compared to the rest of the population, college students are more likely to use instant message, online chat, and file sharing software. It is safe to say that students are perhaps the most active and enthusiastic of all users of Internet technologies.[87]

What is true of students is also true of their professors—to a more limited degree. Most college professors are also regular users of computer technology, a surprising percentage (90%) having been early adopters (since at least 1994).[88] Nearly two-thirds (60%) of faculty are online from four to 19 hours per week, and 40% twenty or more hours per week.[89] Internet use among faculty varies by age, gender, and discipline, but is generally high and increasing.[90] Faculty use the Internet to communicate with colleagues and students, to do research, and to a lesser extent, disseminate knowledge and publish electronically.[91]

Given the widespread adoption of the Internet by both university students and their professors, why would we include professors in our discussion of reluctant users? The answer is that professors, like physicians, have embraced some uses of certain Internet technologies - email, for example - but rejected others, such as Web-based distance learning, electronic publishing, and course management software. That they have continued to do so in the face of considerable pressure from students, administrators, funding agencies, and legislators, suggests that not only are professors selective users of technology, but that they have some power to resist the technological and economic imperatives imposed on them by others. And as in the case of physicians, professors an intriguing group of reluctant users because, for the most part, they make

[87] Steve Jones, *The Internet Goes to College: How students are living in the future with today's technology*. Pew Internet and American Life Report, September 15, 2002. Available online at http://www.pewinternet.org/.

[88] Even more surprising, a third report having used the internet since the 1980s. See Steve Jones, and Camille Johnson-Yale,"Professors Online: The Internet's Impact on College Faculty," *First Monday* 10, no. 9 (2005).

[89] Ibid.

[90] Srinivasan Ragothaman, and Diane Hoadley,"Integrating the Internet and the World Wide Web Into The.," *Journal of Education for Business Journal of Education for Business Journal of Education for Business* 72, no. 4 (1997): 213.

[91] Paul David Henry,"Scholarly Use of the Internet By Faculty Members: Factors and Outcomes of Change," *Journal of Research on Technology in Education Journal of Research on Technology in Education Journal of Research on Technology in Education* 35, no. 1 (2002): 49.

frequent use of the Internet in their personal and professional lives. The seeming pervasiveness of the Internet in the modern academy, however, conceals those aspects of scholarly production and distribution that have remained fundamentally unchanged by technological innovation.

It is important to note that there is perhaps no occupational group more difficult to generalize about than the university and college professorate. By definition the members of this group are affiliated with a fairly limited range of institutional forms - either a research university or teaching college, or some combination of both -and presumably most share responsibility for some degree of teaching and research. Within the loose confines of academic society, however, individual disciplines often cultivate very different disciplinary cultures, values and reward systems, tools and methodologies, and, increasingly, even career paths. It is not always clear, for example, what, if anything, a tenured materials science professor at a major research university shares with a Spanish language instructor at a local community college. To make broad generalizations across institutions and disciplines even more difficult, one of the few academic values that does seem fairly universal is a tendency towards idiosyncrasy and iconoclasm.

Nevertheless, in this section we will seek to describe general patterns in the response of the professorate to the Internet. The focus will be on the faculty of traditional research universities and teaching colleges. Although in recent decades these institutions and their faculties have been challenged by series of structural and demographic changes in higher education, including the rise of online alternatives, for the time being they remain the standard by which all other forms of higher education and academic teaching are evaluated.

Email

Without question, the most widespread use of the Internet by faculty is for email communication. According to a recent study by Steve Jones and Camille Johnson-Yale, nine-tenths of all faculty access email regularly at work, and an almost equal number also access email from home. Many check their email from multiple locations, and as large a percentage of faculty use wireless-enabled laptop computers to access the Internet as does the tech-savvy population in general. Only 14% of faculty reporting that they check their email only once per day—almost a third do so almost continuously.[92]

One obvious faculty use of email is to communicate with colleagues. As such, email simply extends the traditional "community of letters" that has defined academic communities for centuries. The significance of such social networks (or "invisible colleges", as the historian Derek de Solla Price famously called them), has been one

[92] Steve Jones, and Camille Johnson-Yale,"Professors Online: The Internet's Impact on College Faculty". Only six of the 2,300 respondents in their survey reported checking email only a few times per week.

of the grand themes of the sociology of knowledge for decades.[93] In addition, the use of email listserves makes email the ideal tool for disseminating information among widely dispersed professional communities.[94]

Email also facilitates communication with students. This is, in fact, one of the largest uses of email among faculty. Faculty communicate with students to make class announcements (95%), arrange appointments (97%), handle attendance matters (62%), discuss assignments (71%), and field complaints about classes and assignments (52%).[95] Nearly 90% of college students have communicated with their professors via email, and almost half (49%) initiate contact with their professors at least every two weeks.[96] Two-thirds of faculty feel that email has improved their communication with students, and nearly four-fifths of all students agree.[97]

To the extent that email does encourage interaction between faculty and students, however, it often does so by reinforcing existing social hierarchies. Email communication between faculty and students generally occurs within the context of the extended classroom (in which students are being graded) and faculty often have greater expectations of formality and respect than is conventional in email communication.[98] Email allows faculty to control the interaction, serving alternatively as a tool for establishing intimacy and as a means of maintaining social distance.[99] Students feel that they have access to faculty in new and unprecedented ways; faculty are relieved of the need to meet with students in office hours. In this respect, the particular technological features of email suits the needs of professors very effectively. Not only is email easy to use and widely available, but it is also text-based and asynchronous. The former quality means that email fits neatly into the existing work patterns and value systems of academia; the latter that, unlike the telephone or instant messaging, email communication can easily be deferred, ignored, or delegated to others.[100] Faculty have generally not adopted instant messaging or other chat-oriented technologies, which although superficially

[93] Derek J. de Solla Price, *Little Science, Big Science*.

[94] Jeanne Pickering, and John King,"Hardwiring Weak Ties: Interorganizational Computer-Mediated Communication, Occupational Communities, and Organizational Change," *Organization Science* 6, no. 4 (1995): 479-86.

[95] Steve Jones, and Camille Johnson-Yale, "Professors Online: The Internet's Impact on College Faculty."

[96] Jones, Pew College Report, 2002.

[97] Ibid.

[98] Jonathan Glater,"To: Professor@University.Edu Subject: Why It's All About Me," *New York Times* (2006).

[99] Many students report that they feel more comfortable asking questions or discussing course material via email than in person. (Jones, Pew College Report, 2002.). On the other hand, an increasing number of professors are finding that this approachability comes as a cost: students are also more likely to use email to provide excuses for absences, request extensions, complain about grades, and even harass or threaten their professors. Ibid.

[100] Kathryn Wymer,"The Professor as Instant Messenger," *Chronicle of Higher Education Chronicle of Higher Education Chronicle of Higher Education* 52, no. 23 (2006): C2-C2.

similar, to not offer the same benefits.

Cyber-Education

If email is the success story of the academic Internet, however, then the wired classroom is its greatest failure. Like the failure of e-Health initiatives, the failure of universities to fully embrace Web-based educational technology represents something of a paradox. Once again, as was true with physicians and online medicine, university professors have played a central role in limiting the adoption of online instructional technology.

Since the very advent of the networked computer and the microcomputer, analysts have predicted a computer-based revolution in the classroom. From Christopher Evans' 1979 *The Mighty Micro: The Impact of the Computer Revolution* to Parker Rossman's 1992 *The Emerging Worldwide Electronic University*, computer networks have always been seen as the vanguard of educational reform. The rapid emergence in the mid-1990s of the World Wide Web promised to accelerate and extend the revolutionary reach of computerized learning. The Web promised to make access to higher education universal, promote improved learning, and control rising costs.[101] In the late 1990s these costs had risen so dramatically that a National Commission on the Cost of Higher Education was drafted to help "lift the veil of obscurity" that lingered over college education. And Internet technology seemed the ideal answer to the problem: in fact, as Frederick Bennet declared in his 1996 *Computers as Tutors: Solving the Crisis in Education*, the use of such technology was imperative: "schools can use technology more effectively, and for the welfare of students, teachers and the nation, they must do so."[102]

The seemingly sudden emergence of successful and lucrative online-oriented educational institutions, such as the University of Phoenix, appeared to confirm the early promise of instructional technology. By 1998 the University of Phoenix had become the nation's largest private university, enrolling more than 42,000 students at 65 locations in 12 states and Puerto Rico.[103] Perhaps even more importantly, it had become an educational e-commerce phenomenon: within three years of its going public, the stock price of the Apollo Group, which owns the University of Phoenix, split twice and tripled in price.[104] Despite the fact that most learning at the University of Phoenix happens in a traditional classroom setting, rather than online, the success of this and

[101] Ronald Owston, "The World Wide Web: A Technology to Enhance Teaching and Learning?," *Educational Researcher* 26, no. 2 (1997): 27-33.

[102] Frederick Bennett, *Computers as Tutors: Solving the Crisis in Education* (Faben, 1999).. Emphasis mine.

[103] http://www.wweek.com/html/mcniche1032598.html

[104] http://www.fastcompany.com/magazine/68/sperling.html. As of 2005, the University of Phoenix was the largest private university in the United States, with 200,000 adult students enrolled, 17,000 faculty on staff, and $2.25 billion in revenues.

other educational technology-related IPOs encouraged a rush of online education initiatives, even among Ivy League universities.[105] The most famous of these is MIT's OpenCourseWare (OCW) initiative, launched in 2001. The goal of OCW, according to MIT, was to make its entire curriculum - lecture notes, assignments, discussions, quizzes - available online.[106]

The political, pedagogical, technological, and economic discussions that roil around the subject of Internet-based learning are too complex to summarize adequately here. As John Seeley Brown and Paul Daguid have suggested, visions of the "electronic university" are part of a larger historical discussion about distance learning, the democratizing affects of education, the changing role of the university in industrial and post-industrial society, and the entry of for-profit enterprises into a traditionally non-profit educational environment.[107] What is important for our purposes is that, despite the fairly substantial investment that was made in developing online course materials, their influence on the pedagogical practices of university professors has been extremely limited. While an increasing number of professors, particularly those in business, engineering, and medical schools, make use of digital images and presentation software in the classroom, there has not been a widespread shift towards using more revolutionary forms of online teaching resources, such as interactive discussion, computer-aided instruction (CAI), or even course web sites.[108] In fact, a growing number of faculty are concerned that their students spend too much time on the Internet, and are looking for ways to limit access to the Internet, at least in the context of the university classroom. These include bans on laptops, the installation of "kill switches" that allow instructors to close off access to email and the World Wide Web.[109] This curious retreat from the Internet revolution is in part due to concerns about plagiarism and other forms of cheating, but is largely a response to student's using the Internet during class to surf the web, email their friends, and even watch videos.

There are a number of reasons why professors are reluctant to incorporate computers into the classroom. Some are intellectual or pedagogical in nature: professors are skeptical about the reliability of information available on the web, or concerned about their students becoming over-reliant on only digital sources. Others are worried

[105] http://news.com.com/2100-1017-269067.html

[106] http://chronicle.com/free/v49/i15/15a03101.htm

[107] John Seely Brown, and Paul Duguid, *The Social Life of Information* (Harvard Business School Press, 2000).

[108] Tina Kelley,"Virtual-Classes Trend Alarms Professors," *New York Times* 147 (1998).

[109] This curious retreat from the Internet revolution is in part due to concerns about plagiarism and other forms of cheating, but is largely a response to student's using the Internet during class to surf the web, email their friends, and even watch videos. See John Schwartz,"Professors Vie With Web for Class's Attention. (Cover Story)," *New York Times New York Times New York Times* 152, no. 52351 (2003): A1.; Maia Ridberg,"Professors Want Their Classes 'Unwired'," *Christian Science Monitor* (2006)..

about plagiarism.[110] Still more are wary of being dragged into the business of technical support, or have concerns about spotty or unreliable classroom access to computers, digital projectors, and Internet connections. But the real reason seems to be the lack of professional or financial incentives. For many professors, particularly those at research universities, investments made in teaching can yield negative returns. What is valued is research and publication, not pedagogical innovation. Creating useful on-line teaching resources is time-consuming and expensive, and the constantly changing nature of the Internet means that such resources must be constantly updated.[111] And electronic publication, whether informally on a course-web site or more formally in an online journal, was (and is) in most disciplines not considered "real" publication when it came to tenure or promotion.[112] To put it more succinctly, for most professors, the costs of online teaching are high, and the rewards low.[113]

Although in the late 1990s university administrators and venture capitalists still saw great promise in online education, the response among professors remained largely ambivalent. And then, in the fall of 1998, the historian David Noble began circulating the first of a series of articles (later collected into a book), provocatively entitled "Digital Diploma Mills: The Automation of Higher Education".[114] The impetus was an effort at his own institution, York University, that required untenured faculty to put their courses on video, CD-ROM, or the Internet or lose their jobs. Then, according to Noble, these same faculty were then fired and re-hired, this time "to teach their own now automated course at a fraction of their former compensation." In the meantime, the York University administration had established, in collaboration with a consortium of private sector firms, a subsidiary aimed at the commercial development of online education. Their actions precipitated a two-month strike by York faculty, who eventually won "direct and unambiguous control over all decisions relating to the automation of instruction." A small and temporary victory, declared Noble, in a struggle whose "lines had already been drawn" between university administrators and "their myriad commercial partners" and those who constituted the "the core relation of education"; namely, students and their professors. York was not the only university mandating course web-sites and commercializing online education: UCLA had recently launched its own Web-based "Instructional Enhancement Initiative", which also required professors to post online course materials.

[110] Jeffrey R. Young, "Professors Give Mixed Reviews of Internet's Educational Impact," *Chronicle of Higher Education* 51 (2005): A32–A32.

[111] Andrew Trotter, "Too Often, Educators' Online Links Lead to Nowhere," *Education Week Education Week Education Week* 22, no. 14 (2002): 1.

[112] Lisa Guernsey, "Scholars Who Work With Technology Fear They Suffer in Tenure Reviews," *Chronicle of Higher Education Chronicle of Higher Education Chronicle of Higher Education* 43, no. 39 (1997): A21.

[113] Jon Marcus, "Online Teaching's Costs Are 'High, Rewards Low,'" *Times Higher Education Supplement* (2000).

[114] http://www.firstmonday.dk/issues/issue3_1/noble/

The push for online-education, suggested Noble, was just another step in the long march towards the commercialization of the university. The first step had been the development of correspondence schools in the 1920s, an effort also driven by the cynical demands of industry and university administrators. The second was the cultivation, in the late 1970s, of strong ties with commercial corporations, ties aimed at developing an infrastructure for conductive lucrative, commercially-viable research. The final step would be the commodification of instruction into mass-distributable, corporate-friendly electronic courseware. "As in other industries," declared Noble (himself an well-known historian of industrialization), "the technology is being deployed by management primarily to discipline, de-skill, and displace labor." By representing faculty as "as incompetent, hide-bound, recalcitrant, inefficient, ineffective, and expensive", administrators promoted instructional technology as a panacea, one allegedly demanded by students, parents, and the public.[115]

Although the harsh tone of Noble's Marxist polemic was off-putting to some readers, his essay clearly touched a nerve within the academic community. In an academic job market that had been constricting for decades, in which tenure-track positions were being increasingly eliminated and replaced by temporary adjunct appointments, the specter of technologically-driven unemployment loomed very large indeed.[116] Even the true believers in the Internet revolution worried that many cyber-education initiatives were "top-down" efforts driven more by the desire to cut costs than by the real pedagogical potential of the Web.[117] It was difficult to deny that many of the commercially driven initiatives that Noble had identified, including the York and UCLA programs, the emergence of "Educational Management Organizations" (EMOs), and the formation of "Virtual Universities", were very real phenomenon, and carried with them enormous implications for the work of university professors. These last initiatives - the "Virtual Us" as they were known, were consortia of state governments, educational publishers, local employers, and high tech firms. The largest of these, the Western Governors' Virtual University Project, was quite explicit about its goal of circumventing the traditional university:

The use of interactive technology is causing a fundamental shift away from the physical classroom toward anytime, anywhere learning - the model for post secondary education in the twenty- first century.

This transformation, made possible by "advances in digital technology, coupled with the protection of copyright in cyberspace", would create a glorious future in which "an institution of higher education will become a little like a local television station", as

[115] http://www.firstmonday.dk/issues/issue3_1/noble/

[116] Benjamin Johnson, et al., *Steal This University: The Rise of the Corporate University and the Academic Labor Movement* (Routledge, 2003).

[117] Frank White,"Digital Diploma Mills: A Dissenting Voice," *First Monday* 4, no. 7 (1998).

one of the consortium's directors, then Utah governor Mike Leavitt, proudly declared. It was unclear for whom he thought this vision would be appealing.[118]

Noble's essay raised uncomfortable questions about the goals and purposes of Internet-based innovation as it applied in the classroom. Faculty began to wonder, perhaps for the first time, about who owned the rights to their classroom materials. For decades universities had been assuming more and more control over the products of a professor's research, but never before had control over their course materials, syllabi, and lecture notes come into question. The legal issues involved are quite complex, and we will not discuss them here.[119] The point is that for the first time professors were faced with the real possibility that their courses could be taken from them. And in the strange economy of the academic world, courses are one of the few intellectual products that translate directly into income. For the most part academics do not get paid directly from the primary product of their labor, which is scholarly productions (books, articles, conference presentations). Instead, in a process that Yochai Benkler calls "indirect appropriation," these products are transformed, first into reputation, and ultimately (hopefully) into a tenured university teaching position.[120] The teaching itself is not highly valued, but in a certain sense, this is what academics actually get paid for. It is certainly their only activity that translates directly into revenue.

In addition to this financial stake in traditional classroom learning, there are also powerful sociological and psychological factors why professors might be loathe to cede control of the classroom. As David Jaffee has suggested,

The classroom institution has historically centralized power and influence in the hands of the instructor. When faculty walk into the classroom the learning begins; faculty are the source of knowledge; faculty communicate information and influence the students; faculty determine what will be taught, who will speak and when; faculty determine the correct or incorrect answer; and faculty determine when it is time for students to "stop learning" and leave the classroom.[121]

And not only do faculty often insist on maintaining a dominant, authoritative role, but students frequently agree: one of the common objections to interactive or student-oriented assignments is that students have "paid to learn from the expert, not from each other."[122]

Finally, it is not at all clear that there was much of a pedagogical payoff to us-

[118] http://www.firstmonday.dk/issues/issue3_1/noble/

[119] Matthew D. Bunker, "Intellectuals' Property: Universities, Professors, and the Problem of Copyright in the Internet Age," *Journalism & Mass Communication Quarterly* 78 (2001): 675–687.

[120] Yochai Benkler, "Coase's Penguin, Or, Linux and the Nature of the Firm," *Yale Law Journal* 112 (2002).

[121] David Jaffee, "Institutionalized Resistance to Asynchronous Learning Networks," *Journal of Asynchronous Learning* 2, no. 2 (1998).

[122] I know in my heart this is true, but I suppose I need an actual cite.

ing technology in the classroom, or even whether such use resulted in tangible cost savings.[123] Online-only courses are clearly less-expensive to administer, but were a sufficient number of students interested in taking such courses? A recent study showed that only 6% of students have taken online courses for college credit, and of those only half (52%) thought the online course was worth their time.[124] The University of Phoenix had thrived not because it saved money by offering courses online, but because it catered to the largely untapped market of non-college age, non-traditional, fully-employed workers in search of professional advancement.[125] For the vast majority of more traditional students, college is as much a social as an educational experience, and online universities offered little by way of coming-of-age adventure.[126] As John Seely Brown and Paul Daguid have suggested, universities serve valuable social functions that involve more than just the transfer of knowledge.[127] The functions are very difficult to recreate in an online environment.

For all of these reasons and more, the promise of the electronic classroom has thus far not been fully realized. Professors continue to successfully resist the use of Internet technologies, particularly the World Wide Web, that do not "count" in the academic credit system, or (such as instant message) that interfere with more highly valued activities such as research.[128]

Indispensable Intermediaries

This last section describes a broad range of industries in which reluctant users have forced businesses to forego the use of the Internet for direct sales to individual consumers. In doing so, these businesses were unable to take advantage of one of the most compelling features of Internet-based e-commerce: disintermediation, or the elimination of middle-men, distribution channels, and other barriers to "frictionless" commerce. Disintermediation was supposed to doom a host of distributors, retailers, wholesalers, and other intermediaries that stood between manufacturers, service providers, and customers. In some industries this process worked just as expected: witness the decimation of travel agents and independent book sellers described in the previous chapters. But in other key industries that seemed equally suited for

[123] Ronald Owston, "The World Wide Web: A Technology to Enhance Teaching and Learning?"

[124] Jones, Pew College Report, 2002.

[125] John Seely Brown, and Paul Duguid, *The Social Life of Information*.

[126] Gary Wyatt,"Satisfaction, Academic Rigor and Interaction: Perceptions of Online Instruction," *Education Education Education* 125, no. 3 (2005): 460-68.

[127] John Seely Brown, and Paul Duguid, *The Social Life of Information*.

[128] Dan Carnevale, "Never, Ever Out of Touch," *Chronicle of Higher Education Chronicle of Higher Education Chronicle of Higher Education* 50, no. 41 (2004): A29-A30.

direct-to-consumer Internet commerce, the real story is the "disintermediation that wasn't."[129]

Because of the diversity of firms and industries in which "indispensable intermediaries" have successfully resisted Internet commerce, this section will be broad rather than deep. Unlike the previous two case studies, for focus will be on general themes rather than detailed historical analysis.

Channel Conflict and the Internet

In 1995 the clothing manufacturer Levi Strauss & Company introduced a flashy new e-commerce website that included, among other things, the first use animated graphics on the Web. In 1998 it began selling more than 3,000 products directly to consumers. Two years and $8 million later, the site was quietly closed down. It is now no longer possible to purchase jeans online directly from Levi's.

Just as you cannot purchase your jeans via the Internet directly from Levi's, you also cannot go online to buy insurance from Allstate. Or motorcycle parts from Kawasaki. Or a Toyota Prius directly from Toyota (or, for that matter, any automobile from any automobile manufacturer). Depending on where you live, DrugEmporium.com may be forbidden from selling you pharmaceuticals - even in states in which online pharmaceutical sales are perfectly legal. You can purchase tools online from Ryobi, but only at prices that are higher than those at the local Home Depot.[130]

The reason that you cannot purchase any of these products has nothing to do with a lack of technology, or of capital, or because of high shipping costs, or state or federal regulations. The reason is that each of the products and companies listed above has voluntarily (with the exception of DrugEmporium.com, which was forced by an arbitrator) agreed not to compete over the Internet with its real world agents, franchisors, and distribution partners.[131]

Why have some businesses turned their backs on the most revolutionary promise of Internet-based commerce, the ability to eliminate middle-men and interact directly with consumers? In most cases it is because selling directly to consumers via the Internet causes conflicts with other valuable marketing and distribution channels. This is particularly true of businesses that operate on a franchise model: for the most part local franchisees are contractually guaranteed exclusive access to particular territories. In this case, Internet sales violate these exclusivity agreements, threatening the existence of an existing distribution channel. This is what happened with Drug Emporium, when local franchisees responded by suing the parent company. A similar suit has been filed against the tax-services provider H&R Block. In the case of Drug Emporium, an

[129] Guidewire Group, "The Disintermediation that Wasn't", http://www.guidewiregroup.com/archives/2006/01/the_disintermed.html
[130] Luisa Kroll, "Denim Disaster," *Forbes* 164, no. 13 (1999).
[131] American Arbitration Association, No. 71 114 00126

arbitrator ruled in favor of the local franchises, and DrugEmporium was barred from selling directly via the Internet in certain markets.

Even when there is no formal contractual relationship barring companies from competing with existing distribution channels there are compelling reasons to avoid channel conflict. Automobile manufacturers, for example, have long cultivated strong relationships with their network of local dealers. These dealers serve several important functions for the manufacturers: they maintain the local inventories that allows consumers to view, test drive, and purchase vehicles; they allow immediate access to financing; and they provide long-term service and support. In short, dealers play an essential role in the marketing and distribution of product, and in fact assume a number of the costs and risk associated with automobile sales. If the manufactures were to compete too directly with dealers and put them out of business, they would have to recreate these local networks of sales and support in some other forms. Although consumers might have an interest in purchasing their vehicles directly on the Internet, neither the manufacturers nor the dealers have much incentive in doing so. Some dealers are also franchises (and are therefore legally protected from competition), but for the most part such protections are simply not necessary: the business model itself is enough to deter Internet-based encroachment.[132] Auto dealers have resisted any incursion of the Internet into the auto business - even manufacturer-provided information about options and pricing is seen as being detrimental - and thus far have greatly limited its disintermediating potential.

Even for companies with less direct ties to their distribution channels, the reluctance of distribution partners to participate in Internet-based sales and marketing programs can prohibit their implementation. In the case of Levi Strauss, it was conflict with retail chains such as J.C. Penney and Montgomery that forced it to withdraw from e-commerce. When faced with direct competition from supplier-based Internet sites, retailers respond by withholding information about sales and inventory, refusing to process exchanges, or threatening to remove products from shelves. Home Depot sent the Ryobi Group, which makes the Craftsman line of tools, a letter warning Rybobi not to undercut Home Depot prices on their direct-to-consumer website. Tower Records sent a similar message to the vice president of sales at Warner Brothers Records. In both cases, the retail chains were able to use size and influence to control the ways in which the Internet would affect their businesses. Other, smaller retailers have not always been so successful.

Obviously there are ways in which businesses can successfully use the Internet and still avoid channel conflict. The point of this section is to suggest that even in the realm of e-commerce groups of reluctant users—in this case marketing and distribution

[132] Diane Katz, and Henry Payne,"Traffic Jam: Auto Dealers Use Government to Build Internet Roadblocks," Reasononline (2000).

partners —have been able to shape the ways in which Internet technologies have been implemented and adopted. Once again, it is the details that matter: certain industries have adapted readily to direct-to-consumer Internet sales, often at the expense of intermediaries. In other cases, these intermediaries have shown themselves to play a much more significant, and perhaps indispensable, role in the distribution chain.

Real Estate

Residential real estate is another example of an industry that was expected to be entirely transformed by Internet technology.[133] Real estate was traditionally been an industry dominated by intermediaries. In the previous chapter Jeff Yost has addressed the impact of the Internet on the real estate industry as a whole; this section will describe the ways in which particular group of users—real estate brokers—have mediated and influenced this impact.

The average home purchase involved at least sixteen participants: real estate brokers (for both the buyer and seller), mortgage brokers, bank agents, appraisers, inspectors, and title company researchers, among others. The transaction costs associated with such a purchase were significant—more than 6% of the total purchase price - most of which went to the real estate agents. If ever there was an industry ripe for disintermediation, it was residential real estate. Through its control of the Multiple Listing Service (MLS) database, however, the National Association of Realtors (NAR) was able to limit competition and maintain high rates of commission for its members. Like their analogs in the travel industry, real estate agents relied on their proprietary access information to assure their central role in the transaction chain.

By the early 1990s, new technologies and markets were emerging that threatened to eliminate the NAR's monopoly control of the industry. In particular, the increasing availability of Internet-based listings seemed to make agents irrelevant: "If buyers and sellers can sit at their personal computers _ and gather enough information about each other's offerings - and even make offers - why should they pay an agent? "[134] Industry observers predicted that the Internet would have "profound" implications for the industry, and bring with it reduced commissions, lower incomes, and downsizing.[135] In his 1996 *The Road Ahead*, Bill Gates himself declared that the real estate industry would be "revolutionized" by technology.[136] Internet-induced disintermediation seemed imminent.

[133] John & Guttery Baen, Randall,"The Coming Downsizing of Real Estate: Implications of Technology," *Journal of Real Estate Portfolio Management* 3, no. 1 (1997).

[134] M. Rosen,"Virtual Reality – Real Estate Agents Face Extinction in an Information Rich Century," *Dallas Observer* (1996): 6.

[135] John & Guttery Baen, Randall,"The Coming Downsizing of Real Estate: Implications of Technology."

[136] Gilon, P. and Cardenas, C. Appraisers and Cyberspace: An Introduction to the Internet. Appraisal Journal, 1995. 63(4), 469-481.

By the end of the decade, the Internet had indeed eliminated the real estate agent's monopoly access to information about housing stock. Sites such as Yahoo! Real Estate, MSN's HomeAdvisor.com, Homeseekers.com, Homestore.com, and even the NAR's own Realtor.com made MLS data widely available, and in addition provided visitors with data about neighborhoods, schools, taxes, cost of living, as well as tools for financing and insuring a home.[137]

And yet all of this new information made available by the Internet has had remarkably little affect on employment in the real estate industry. Although as Jeff Yost has suggested, the average commission earned by agents has decreased slightly in recent years (from 5.5% to 5.1%), both the total number of real estate agents, as well as their median income, have increased steadily. Agents still remain central to the purchasing process, with Internet-based "for sale by owner" sales actually decreasing in the years between 1999 and 2001.[138] Despite the widespread availability of technologies that promise what still seem to be gross inefficiencies in the traditional real estate market, real estate truly represents the "disintermediation that wasn't."[139]

So how were real estate agents able to avoid the potentially negative effects of the Internet? Unlike university professors and physicians, individual real estate agents have very little power in the marketplace. Barriers to entry in real estate are low, and competition in most local markets heavy. It would seem that although agents would be reluctant to embrace the Internet, that they would have little control over whether or not, or even how, it might eventually be adopted in their industry.

To begin with, real estate is a complex product that does not lend itself well to Internet purchasing.[140] Buyers might use the Internet to gather basic information about location, lot size, price, and number of rooms, but other forms of information require hands-on, qualitative evaluation that can only be gleaned from an on-site visit. Homes are not like plane tickets, as one insightful observer has suggested.[141] Not only are they much more expensive, making the risk associated with an ill-informed purchase much more significant, but each home is also a unique entity. Even in very hot markets, most buyers are still unwilling to purchase real estate directly over the Internet. Local agents are still able to provide value by gathering and presenting information that cannot be readily captured on a Website listing.

Real estate agents have also been able to successfully transform themselves from purely information brokers into providers of "process support."[142] Real estate pur-

[137] Waleed A. Muhanna, and James R. Wolf, "The Impact of E-Commerce on the Real Estate Industry: Baen and Guttery Revisited," *Journal of Real Estate Portfolio Management Journal of Real Estate Portfolio Management Journal of Real Estate Portfolio Management* 8, no. 2 (2002): 141.

[138] Ibid.

[139] Guidewire Group, "The Disintermediation that Wasn't".

[140] Ibid.

[141] Guidewire Group, "The Disintermediation that Wasn't".

[142] Kevin Crowston, et al., "How Do Information and Communication Technologies Reshape Work?

chases are complex legal and financial transactions, and real estate agents have become increasingly active participants in the transaction process:

Some business-to-business aspects are moving toward standards like XML to smooth workflows between, say, mortgage lenders and title insurers, but conceiving of the process as analogous to even car-buying ignores the coordination and other roles played by a trusted party in a complicated, emotional, and large purchase.[143]

By guiding buyers and seller through a complex process, agents add value beyond their ability to broker information about housing stock. In this new role agents actually embrace information technology, because in this context it enables new forms of work rather than threatening monopoly control.[144] Although cell phones and digital cameras have thus far been more useful to agents than the Internet, increasingly they are turning to email and the Web for communications and marketing purposes (including the use of personalized information portals and blogs).[145]

Finally, although individual real estate agents rarely have much economic or political power, the National Association of Realtors is well-funded and influential. In many states, the NAR has effectively limited attempts to create alternative business models in real estate - models that involve more than no-frills "for sale by owner" listings but less than full-service, agent-mediated transactions.[146] As we have seen, travel agents were not so effectively organized.[147]

Conclusions

Although the Internet in increasingly well-integrated into the modern commercial and communications infrastructure, its effect on American business is not always immediately apparent, at least in certain industries. Rather than dismissing these industries as being exceptional, or their participants as backward "neo-Luddite", this chapter has attempted to focus on their reluctance as a means of provoking a more nuanced discussion of the role of technological innovation in shaping American business practice. In fact, as we have seen, these "reluctant users" are perhaps not so much reluctant as selective: like most users they are simply attempting to limit or influence the way in which technological innovation undesirably affects their work practices, professional authority, or individual autonomy. And so professors embrace email but not instant messaging, and physicians the World Wide Web but not email. In both cases these

Evidence From the Residential Real Estate Industry" (Paper presented at the International Conference on Information Systems, 2000).

[143] Guidewire Group,"The Disintermediation that Wasn't".

[144] Ibid.

[145] Kimberly Blanton,"Realtors Get Their Hands on Technology," *Boston Globe* (2005).

[146] Guidewire Group,"The Disintermediation that Wasn't".

[147] Cite Jeff Yost's chapter.

are users with influence and the ability to explicitly and successfully resist change. But, as Trevor Pinch and Nelly Oudshoorn have recently suggested, all users matter: collectively considered, users "consume, modify, domesticate, design, reconfigure, and resist" technological innovations.[148] This is particularly true of such an amorphous and protean technology as the Internet. And just as we must be aware that the selective users of the Internet have interests and agendas, we should recognize the same of enthusiasts and advocates. In this way we can better situate the commercial Internet in terms of a larger context of economic transformation, social change, organizational politics, and professional development.

[148] Nelly Oudshoorn, and T. J Pinch, eds. *How Users Matter : The Co-Construction of Users and Technologies*, vol. Inside technology (Cambridge, Mass: MIT Press, 2003).