Technology and Social Change:
The Effects on Family and Community

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Introduction

My section of this seminar, the effects of technology on family and community, can only be understood in the details of daily life. Technology is binding the world of work and the world of home in ways that redefine what is means to be in each. Some changes are dramatic, others are subtle, but the changes are experienced in the mundane activities of everyday life. To begin this presentation I will tell you a story. This story may not reflect your own lives, but I imagine some details will have a familiar ring to them.

> John is a middle-aged product development manager at a high tech company in Silicon Valley. He bemoans the fact that he no longer has the kind of personnel support he had even 10 years ago. While he shares an administrative assistant with several other managers, he is now expected to handle his own communications, create his own presentations and manage his own time and financial budget. After all, he now has a PC to improve his productivity, and interactive on-line calenders to manage his time. The nature of his work means that he is in constant contact with engineers, the general managers above him, and his counterparts in different sites in his international company. He has more contact, and more in common, with his counterpart in Taiwan than the person in the next cubicle. He tries very hard not to take too much work home with him, preferring to work late on site, but the international nature of his work means he is on the phone at midnight and at dawn. He is grateful for E-mail and voicemail since they can fit his schedule. Realistically, he thinks about work problems constantly, in his garden, and in his car. He talks about his work all the time with his wife and volunteers to install network servers at his daughter's school on Net Day.
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> Meanwhile, his administrative assistant, Sharon, complains that her work load is overwhelming, even to the point where she is expected to move furniture and take out trash. She is expected to learn new programs and upgrades on her own time. Both John and Sharon now take work and worry home. Sharon checks her E-mail and voicemail in the predawn hours before her children wake to prepare for any tasks that may need to be addressed immediately. She carries a pager and a cell phone so that she can stay in contact with her teenaged children after they come home from school. All of them feel much safer for the presence of these devices. They can now stay out longer and be more independent since they are "in contact." The only time they have been physically together in several weeks is for the anthropologist's visit to their home for an interview.

This vignette is drawn from a host of interviews and observations done over the past seven years in a series of studies dubbed "the Silicon Valley Cultures Project." I have been part of a team of anthropologists, along with Charles Darrah and James M. Freeman, that have been studying technology and community in Silicon Valley. While the larger issues addressed by my colleagues here today also interest us, our particular emphasis has been on the study of technology in daily life. We have treated Silicon Valley as a laboratory for technological saturation, where talk about technology surfaces easily at work, at home and in the community and can be therefore captured by eager social scientists. Silicon Valley is also a place with a well defined regional identity, in which discussions of reinventing community are common fare. We have sampled the intersection of technology and community in a variety of ways. In 1995 we worked with the Institute for the Future who combined a large scale statistical survey with an intensive ethnographic study of "infomated households." These are households with a critical mass of at least five information devices, including some combination of VCRs, CDs, laser discs, fax machines, answering machines, voicemail services, computers, and cellular phones. How did these devices enter and flow through peoples lives? What impact did they have? This study highlighted an unexpected connection. Infomated households revolved around work, both paid work and an endless series of tasks that formed a greater environment of work ranging from gainful work to voluntary activities and "working on ones family." This project led to 450 detailed interviews with people on work/home/community interface in Silicon Valley, soon to be partially funded by the National Science Foundation. We entered a variety of work spaces, at "work" and at home to view how people managed the intersection between these domains. Meanwhile, we also conducted related studies, collected hundreds of stories on how people decided to purchase devices and how they managed interactions across different cultures and generations. We also interviewed more than fifty community leaders about their visions of the future of community in the Silicon Valley region. Finally, using this research as a base, we are about to launch an intensive observation-based study of families and work in Silicon Valley sponsored by the Alfred P. Sloan Foundation, investigating even more deeply the issues highlighted here today.

Please note that I am not separating information technologies from the institutions that act as conduits for the entrance of those devices into the home. Technology is not context free. Devices brought home from work organizations and schools are accompanied by styles of use and assumed purposes that follow that fax or that Mac into the household. As the boundaries and distinctions blur, we abandoned the idea of sharply separating the domains but instead we traced the flow of technology through peoples lives. It is in the context of this research that I comment on family, community and technology.

Technology and Family

As mentioned earlier, one of the most strikingly obvious impacts of information technology is the shift in the work-home relationship. We encountered people that said they never took work home, yet the computer had its own room and engineering magazines littered every flat surface. We had to question our assumption that we knew what "work" was. Work was not a single coherent entity, but a collection of different things. People talked of their "work"—ongoing career preparation, finances, parenting. But they distinguished that from their "work-work," that is, paid work for a particular organization. A large proportion of supposedly free time was spent thinking about "work-work" while in the shower, eating, or driving. As is discussed elsewhere in this seminar, information technologies have been instrumental in redefining the scope of work.

We asked people what made them a family? Repeatedly the answer was "we do things together." To these interviewees, the family is not a natural unit that simply exists, but one defined by action. Families watch TV, camp, travel, eat and *talk* together. The devices that facilitate that action or talk—phones, networked computers, pagers, answering machines—take on a serious purpose for these people. Paging your children to let them know you are concerned that they arrived home safely from school demonstrates parental responsibility. Sharing an evening of movies or technology talk provides an opportunity for *doing something together.*

The interactions between information saturated work and networked families are governed by complex rules. As one interviewee noted:

> At the time, there was a lot of hard copy paperwork at my job. I thought it would be real convenient to have a fax modem. . . I also hoped that the computer would save me time, and get me ahead at work. I mean, I don't work at home because it is so great. I would rather do other things. But I saw, or hoped, that working at home would allow me to get even more done and give me an advantage at work. And then I thought that if I need an occasional afternoon off, it would be okay because I would be ahead. Of course, that was naive. Everybody works at home and now it is a standard. Working at home doesn't let me get ahead, it stops me from falling behind.

The colonization of home time by work is only the most obvious impact. As we talked to people at work and home we discovered that only certain kinds of work come home. Because the information saturated work environment is infinitely interruptible, activities that require concentration—especially writing, reading and reflecting—get shipped home where it is vainly hoped that uninterrupted time can be cultivated. People respond to this relocation in a variety of ways. Some have clearly scheduled "Mommy is working now" times. Others try to manage post bedtime shifts. Many resist, trying to create boundaries by manipulating the technologies. The interactions can be subtle. For example, a highly placed city official tries to separate work and home by creating a barrier of physical distance, a common strategy. She commutes several hours a day to be able to maintain an affordable, distinct home life. During that commute she uses her cell phone to begin and end her management day. Her action has led to a "voicemail organization" at city hall in which E-mail contact is reduced. While this is convenient for her, it limits the telecommuting strategies other people in the organization might have used to manage their work-home juggling. Her family driven choices ripple through the organization and back into her colleagues' family lives.

The penetration of work uses of information technology into the home leads to an access dilemma. "I want instant access to you but I want to minimize your access to me." This strategy increasingly leads to the use of home as an environment in which interruptions can be carefully managed, even between family members. Note the tone in this comment, "I get stressed when David doesn't have his (cell) phone on. You know, we have them for a reason, and I'll be trying to call him and I find out that he has the damn thing turned off." Often even non-use of devices is carefully managed—by turning off the phone, avoiding using cell phones in the car, or checking for E-mail or voicemail at only certain hours.

Changes in work relations and management styles have also altered the way families talk about themselves. Families increasingly view themselves as management problems to be solved, just as they would be at work, with technology. Pagers, cell phones and answering machines, and now palm pilots, are used in tandem to coordinate complex household schedules. Work, school

and recreational activities demand transportation, sequencing and division of labor. One software engineer, turned at-home mom, remarked that she was now prepared to go into project management after a few years of managing two small children and an occasionally telecommuting spouse. She had each day carefully orchestrated. She had her days at the cooperative day care center in which she coordinated the daily treats and food lessons with diverse other mothers using databases of recipes. Armed with databases of parenting articles, she acted as informal expert among her peers. Christena Nippert-Eng noted in her book on *Home and Work*, that people used their calenders as a way of marking the home/work domains. My interviewees now talk of using their upgraded palm pilots to fully integrate home/work divisions of labor—beaming their spousal schedules to each other. The perceived safety net of technology also allows planning to become ever more "just-in-time." Message machines and pagers allow plans to be created, shifted and coordinated in the space of a single afternoon.

The families we studied use information technologies to "work" on themselves. They use the telecommunications devices to coordinate activities ranging from after school baseball to weddings. They create networks of connectedness by making and sending videotapes and E-mailing distant relatives. Family histories are recorded and distributed. Cell phones and pagers create a sense of street safety, although realistically most of our interviewees actually used them more often for traffic management than emergency pleas for help. One woman used the LCD information on her husband's pager to discover an infidelity that led to a sudden restructuring of the family. These uses are not trivial, but ones that shape people's social reality.

Information technologies simultaneously perpetuate and alter family roles. Not too surprisingly some gender stereotypes were invoked as family members adopted "expert roles" within the households we studied. "Techno-experts," often associated with high technology work, were most often 30-49 year old men who could talk about technology with great facility. In contrast, their spouses, who often deemed themselves inexpert, were interested in the using, not discussing, the technology. Note the following exchange:

> It's always the same pattern. Colleen would ask me a question, 'How do I do something?' . . . Something that is really difficult for someone who really understands computers to talk about without giving some background. . . But she goes into the mode. 'Just tell me what I need to know to get through this in the next ten minutes.' (Colleen responds) 'I'll say just tell me what to do.' Then he says, (she lowers her voice) 'Well, you have to understand blah, blah, blah.'

As another woman put it, "It is a man thing. Women just let men do it." However, in that supposedly "inexpert" role these people, mostly women, do manage to interconnect various telecommunications devices into a network of practical connectivity.

People also use technology to subvert old roles. One septuagenarian viewed her skill with multiple programs and Internet environments as a sign that she was "empowered" and distinct from more Luddite age-mates. Another aging mother found her role as family center being eroded by her children's constant E-mail contact. She was now superfluous as the siblings talked directly to each other and not through her. With information devices distant kin can interact more often than immediate family. Parental and gender roles can be both controlled and challenged using the devices. Rules are created to control family roles: "You must wear your pager," "You must carry your cell phone," "You must not use the computer during dinner." These rules are subject to resistance. Exploring the nature of that defiance would reveal much about the workings of family and technology.

Technology and Community

The high technology industry has also added a global dimension to the workings of community. In the nineteenth and early twentieth centuries the Central Californian economy revolved around fruit orchards, worked by an immigrant population that hailed from Portugal, Italy, Japan, China and Western Europe. Contemporary Silicon Valley high tech employs a culturally diverse work force. For example at Sun Microsystems a single thirty-five person work team might be comprised of engineers from Bangladesh, Canada, China, Ethiopia, India, Iran, Japan, Korea, the Philippines, Taiwan, Vietnam and the United States. This region has a complex pattern of immigration, spanning the last century, made more intricate by the influx of "new immigrants," largely Asian, educated and functionally transnational. This makes any discussion of technology and family, or technology and community more complex. People from around the world are bringing different ideas of what constitutes family, work, and community. Devices do different things to different types of families. In our ethnographic study of Infomated household the same devices might have strikingly different impacts in different types of families. Common use of VCRs, karaoke systems and telecommunications devices pulled together already close Vietnamese families while allowing other kinds of families to fly farther and farther apart. In one Hispanic family each new information technology was placed in a carefully orchestrated system of devices that encouraged tightly-knit extended family and community interactions. The same devices—camcorders, computers, home entertainment systems—fragmented other families into smaller and smaller interest groups. In one Chinese family, an adult son was brought into parental orbit in order to teach his mother new computer skills. In another family, those same computer skills might place the adult child firmly in a corporate world beyond the reach of family as his life is consumed by work. The role of culturally generated family obligations and expectations on differential device uses begs to be researched.

Just as technology has changed the way people talk about family issues, technology saturation has also influenced the way Silicon Valley folk talk about their community. Joint Venture Silicon Valley, a community partnership between government and business responded to the early nineties' recession by proposing that the region boldly "reinvent" itself. Using the language of engineering, entrepreneurship and design, community issues—such as housing, transportation, education and recreation—are recast as "value-added" factors to be used to recruit new businesses and workers. These instrumental features can be improved, preferably by adding more technology.

One of the most striking examples of this perspective came from the Smart Valley Initiative within Joint Ventures. Smart Valley is an organization that began during the economic downturn of 1992, implementing, in the words of a Smart Valley Board member, "a high-speed, fully capable, broad band infrastructure—so every home, every office will have access to high speed communications." Another engineer member added "that the industry that was responsible for creating this technology felt they had a responsibility to get our local society to use it more effectively." This group has transformed marketing into a mission, using the language of a social movement. Articulating the mission an interviewee said:

> We want to facilitate the construction of a pervasive, high speed communications system and information services that will benefit all sectors of the community—education, health care, local government, business and the home. The infrastructure we implement will help transform the way we work, live and learn.

Smart Valley formally dissolved this year after having accomplished their major goals. These included supporting several initiatives promoting community use of technology. For example, the Smart

Valley Telecommuting Project sought to enhance the capacity of companies to support their employees who work at least partially in their homes. Their rationale was simple:

> With Silicon Valley businesses seeking innovative ways to maintain their competitive edge, recruit and retain key individuals and enhance the quality of life for all their employees, solutions such as telecommuting takes on a much greater role than that of a "nice concept." The Smart Valley Telecommuting initiative is moving telecommuting from this "concept" to a recognized business strategy that provides benefits to Valley businesses, their employees, [and] to the region as a whole.

Another initiative, the Smart Valley Schools Internet project, created a series of Net Days in which volunteer expertise was coupled with corporate donations to link K-12 schools to the Internet, thereby enhancing what was widely considered by interviewees to be a pitiful state in education. In their own words, the networking of schools would "integrate technology as a tool to enhance the learning process and in the process teach students to live and work productively with technology. The efficient utilization of information technology will help our schools and students achieve world-class education standards." These approaches have in common a particular assuption, that technology will solve problems in such a way that the both industry and community can benefit.

Silicon Valley is reviving an old notion, reinventing the company town. The classic portraits of a company town describe a single company, maybe a mining or logging company, often geographically isolated, that owns the land, housing, service facilities, and public utilities and dominates the business life of the community even though other private enterprises may exist. Company towns are *administered* communities, not exclusively representative of the residents' interests, but the company's need to succeed in a given industry. Joint Venture Silicon Valley has successfully redefined the concept of a company town. Using lobbying, government partnerships and "innovative initiatives," companies have reached out to redesign the governance, schools, utilities and even health care facilities of the community to make it "a better place for business."

Assumptions revisited

In the process of doing these projects we often stumbled over assumptions we discovered to be misleading. These premises often go unquestioned, because they reflect the everyday way we think about technology and family, but they keep us from gaining important insights into the interplay of technology, family and community.

First, we discovered that people don't just own or use individual devices, but ecosystems of technologies at home. Pagers, faxes, cell phones, telephone answering systems and computers are used together to serve the goals of individuals and families. Second, family use of technology is not trivial, but underpins important cultural work done by families. Families frame playing computer games as gaining "computer literacy" and providing a common activity for "being a family." Third, contrary to prevailing mythology, especially common in Silicon Valley, families and communities are not transformed into wholly new things by technologies. Instead the technologies allow families to put old behaviors and relations into new contexts. The old family game of control and resistence to control is being played out on E-mail, but the game remains. Fourth, technology does not just play a economic role in defining families and communities, but also a metaphorical, symbolic one. As information technology allows households and communities to become places of production, it also changes the way such social institutions think of themselves. Families and communities, like

upgraded software can be “refreshed” or “reinvented.” Families can then become a kind of product. Finally, the pivotal assumption that work is done at a workplace and family life is lived at home is much too simplistic. Many forces, not the least of which is the technical ability to work from home, have blurred the domains. If time at the workplace does not really reflect the time spent working, how does that effect family leaves or the length of a work week?

The forces that shape community and family include many factors, not just information technologies. Yet we need to know how the many devices entering people’s lives are actually used by real people. They are creating culture as they make decisions about what constitutes work, family and community. I am part of the culture, as you may well be. You have been given a handout, an inventory of digital devices that we use when making observations about household technology. Feel free to take the inventory home and consider how you use the technologies. What roles do these devices play in your own life? How do they sustain or change your relationships? How will the sum of these small impacts change the way we live? It is not homework, you need not return the inventory to me, but use it as our interviewee do, to reflect on the changes we rarely question.