Silicon Work:
Tales of Trust from Silicon Valley, Bangalore, Taipei and Dublin

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Many different kinds of research on high tech work have been done and discovering the importance of trust is not original to us. However, the ethnographic focus on daily experience and social relations—in a comparative framework—has allowed us to see the range of processes relating to trust—its inception, development, maintenance, and failure.

The setting is a tall glass building, gleaming from the heart of one of Silicon Valley's "Darth Vader" villages, tilt-up structures surrounded by parking lots. A team of anthropologists is conducting interviews with the denizens of this community, exploring the social realities experienced by high tech workers, examining their material world, probing their social connections and eliciting beliefs and values. They are asking questions about work practices, personal networks and community activities.   One person draws a map of her work day, placing a giant telephone at the center of her world. Another shows one of the anthropologists artifacts of various projects he has worked on, pointing out the photos of the engineering team that seemed "like family" during a particularly grueling project. A software engineer tries to explain how his work gets done, drawing a verbal picture of a network of colleagues, some in his current company, others from past connections. He says:

> [The corporation's] products are large and complex enough—most products are, these days— that it's more than one person can do. A team is going to consist of marketing people who decide what features the product has to have or the new upgrade has to have, managers who try to schedule the time and decide what's feasible to do, engineers who do the coding, international people who do the translations into other languages, test people who do the testing, and tech writers do the manuals. There's a ton of people involved . . . Most of my time I spend on my [who] own in my office working on my chunks of code, but there are two or three other people that I have to talk with and coordinate with on the code, including my

manager. And the number of people I have to work with varies. Every so often I find I need someone's expertise that I haven't worked with before. I'll be talking to the QA [quality assurance] people more. I've been talking to the installer person a bit. Occasionally I have to talk to a marketing person. So—it's kinda fuzzy . . . There's a once-a-week staff meeting for the product I'm working on that nearly everybody shows up at, and common issues are raised and discussed there. And then you use E-mail and voice mail and drop into the office for some of the other stuff. Voice mail and E-mail are really good because you don't have to find somebody in their office and free . . . And they there are others that I chat with when something of mutual interest comes up, but I don't keep them up to date on, you know, how the kids are doing in school, or anything. There aren't a whole lot of them, but a couple of them are very good friends, so they're worthy of mention . . . one of them is in upstate New York, another is on a farm in Minnesota, and one of them is a software developer in Perth, Australia . . . [SV068]

He goes on to elaborate that once a year he throws a party at his house for his developer friends during an international software developer conference—13 hours of playful shop talk that sets up a year of virtual interactions.

In another part of Silicon Valley a manager of information systems in a computer company discusses his global connections. The anthropologist asks him to describe all the places he works and he elaborates:

I go to Taiwan and Tokyo every three, four months . . . Usually three or four days at each location . . . In Taiwan and Tokyo in the office itself it's usually around eight hours . . . usually there is two to three hours at each end for meetings . . . going to dinner with people there . . . the none work and socializing with people at work talking about work, so its . . . depending if you want to classify that as work . . . am I sitting here with a paper and pencil doing a spreadsheet for work, "No." Am I talking and planning and establishing relationships with my workers, "Yes." . . . you have to. It's not an option. It's not an option if you're going to be successful.

Another anthropologist interviews an the admin who relates other stories about the importance of creating networks. She is responsible for scheduling and implementing meetings and trips. She consciously creates an aura of cordiality learning names and asking about personal details. She tells how she once needed to get a piece of equipment to an airport, but could not find the right people. She says, "all the sudden, somebody came around and it's like God sent them to me . . . This is my idea of synergy. The people that I was trying to call, they just happened to come around with the type of equipment that I needed . . . when they saw that it was me, they said, 'Oh, I'd be happy to help.'" [SV023]

Meanwhile in Bangalore, India a project manager in an international IT [information technology] firm tells one of the anthropologists the scope of his network. He says:

I connect to the other project managers and the customer, [the company's] project managers. I connect to the people, technical people. I connect to my own guys sitting there, international there . . . Plus sometimes I connect to some vendors, for example, tool vendors. I have to purchase tools, so I need to talk to those people. And then, I need to deal with my own people, my own managers. I deal with business partner people they supply people to me . . .

I need more skills I don't have, so I don't need them on my head count, I buy them, buy the people, the sources . . . I deal with a lot of people from [the corporation] internally [in Bangalore], who support me, like HR [human resources], finance, IS [information systems], business partner management people, the sourcing people, besides my team . . . And they're very important because, they don't report to me, but if they don't support me, I'm doomed . . . And then, many times, we use the customer's equipment, too, so we need to connect to their people to make sure that it works. And then, I deal with external customers here in India . . . I'm part of the CII, the Council of Indian Industries . . . that's a body of industry there, discussing the problems in India, Y2K problems, how can we help and suggest, comment, etc. [Bangalore 17]

Workers in high tech, ranging from the prototype machinist to the CEO, describe a web of connections. Some of these connections are face to face and reflect near daily interaction. Others are physically and socially distant and mediated by communications technologies, particulary the complex ecosystem of telephony and computer-based devices. The communications are linked by common features. The interactions are intermittent and reciprocal. Flows of information, people, talent, money and material are necessary to get tasks done, whether those tasks are in the creation of technology or its distribution. Favors are asked that require extra effort, competence and reliability. These requests are made under trying political and cultural circumstances. Internal competition and cultural differences make interdependent work more problematic. In short, high technology work requires trust.

The ideas in this paper are the result of more than 10 years of ethnographic effort. This effort has been directed at understanding "technofied communities." Such communities contain an strong economic focus on high technology industries. Our task is to understand how this economic focus plays out in the daily lives of people living in such regions. For example, California's Silicon Valley has at least 8,000 work organizations, not including a vast informal economy, focused on a variety of high tech industries. Thirty-seven percent of Silicon Valley's gross regional product is from high tech. This core of high tech workplaces has a halo of institutions subtly transformed by the presence of high tech. Educational institutions, gyms, caterers, therapists all shift their practices to accommodate the tech world. Family networks embrace at least one member that lives within the tech sphere. Technological metaphors and technologically informed problem-solving strategies dominate public discourse. Although Silicon Valley is the most robust and visible technofied community, other "silicon places" reflect technofication. Whether it is software production, as in Dublin, Ireland or IT production in the Taipei-Hsinchu corridor of Taiwan, other communities reflect high tech economic specialization.

Since we are interested in how this cultural pattern is enacted in daily life, we have used traditional anthropological tools to investigate the phenomenon. For example, in Silicon Valley we interviewed 163 people, averaging six hours each, about how they actually do their work and live their lives. Using open-ended questions in context—the interviews were done in the work spaces and at home—we tried to paint an ethnography of life in Silicon Valley, in and out of high-tech work, across a variety of cultural backgrounds and classes. We are augmenting this research with detailed studies of a dozen dual-career middle-class families in Silicon Valley, each family enduring hundreds of hours of structured observations at work and at home. In addition, collaboration with the Institute for the Future, IFTF, has led to significant insights for us. In 1995 a team of our students conducted research on the use of information technologies in the household, followed the next year by a study of communications technologies in Fortune 1000 companies. These studies made us reflect on the role of devices in work practice done in the official workplace and in the household. In 1998-1999 we collaborated with IFTF to collect information on work practices, social networks and global

interconnections in three places identified as technofied communities—Bangalore, India, Taipei-Hsinchu, Taiwan, and Dublin, Ireland. This cross-cultural component allowed us to elicit commonalities in global high technology work and explore distinctive cultural and social differences. Concentrating on daily experience and cross-cultural comparisons are the hallmarks of anthropological inquiry.

Our informants described a world of in which they gather and pass resources both intellectual and material in order to do their work. Issues of trust emerge when work depends on the kindness of strangers. The social construction of that trust is the focus of today's paper. Trust is a requirement of interdependent work, an intrinsic feature of high technology practice. The trust is constituted differently in diverse contexts. Establishing trust at a distance, in a vast virtual community requires social effort. The use of technological mediated communications makes establishing, building and maintaining trust more convenient and more problematic. Trust reflects social and political realities of organizations and global capitalism. Social and technical infrastructures shape the tools used in trust relationships. There are also inherent contradictions in trust relationships. Honest disclosure to a fellow engineer may build trust while the same disclosure to a customer insures failure. Trust is redefined in various interactions, with peers, customers, supervisors, and larger organizations.

At the individual level, global high tech work necessitates working at a distance interdependently, a less than reassuring situation. One multimedia division manager in Taipei noted:

> You're information driven. Since you're co-working with other people, it's not just the Taiwan experience that will count. If I want to work with a designer in the US, I need to know how they work. It makes me, in terms of working—I feel constantly a lack of information. Because I need to work with people, not just in Taiwan but other areas. Those people are virtual . . . But my work partly relies on them. So it makes me feel a little less secure because you can't really see things. You can't control it. [Taiwan 05].

Part of building a sense of trust among strangers is to make them seem less strange. One Bangalore manager discussed how he did when he had to transfer his people to another team to work. Instead of merely communicating job specification, he tried to communicate more personal information to the new supervisor. He worked at conveying the social context—the engineers "intra personal relationships" and working styles. This sensitive information is "locally confidential," and he hopes that the supervisors will rise to the occasion and understand the burden of trust placed on them. While he admits this strategy is not always successful, his objective in sharing this information to fellow managers is to achieve the necessary trust to complete the work.

The vastness of the global work also makes it difficult to establish an organizational presence. Key to establishing that presence is developing a pattern of trustworthiness and reliability. A founder of an IT company in Taipei reflects:

> At first, we had the idea to be a global company but we didn't know how to do that. Because we didn't have any reputation. We didn't have any connections. We didn't have money at first. We only had technology. That's the only thing we had. So we tried to prove that we had very good technology. We cooperated with Microsoft, with IBM Taiwan . . . in the first year. After we proved that people can trust us, we had a very good reputation in Taiwan. Lots of very big companies looked at us and wanted to cooperate with us. So that was the beginning. [Taiwan 01]

She goes on to reflect that global communications have shifted significantly with the advent of E-mail and Internet access. While telephone communications are still significant, E-mail makes multiple communications convenient. However it also poses problems. She notes, "If I send a file to you, you can send this file to others, forward it to others or cc it to others, so there are no secrets. You only can trust people that they won't do that . . . I should trust you, or I can not send anything to you. We can not share anything."

Inherent in group production practices is the need to share information, be it source code or budget restrictions. A project manager in Bangalore notes "We are the same engineering group. In an ideal situation, we should have a very high level of trust. We should be able to share everything." [Bangalore 04]. However, openly sharing information is not the only way trust is constructed. There is an affective component as well.

In both Taipei and Silicon Valley there was a strong emotional component in the way trust was described. The Taiwanese talked of ganqing, cordiality, and creating a level of "comfort" in interpersonal relationships. It is established by creating a network of known players that can be accessible to coworkers and customers. A known relationship can be the platform for trust while interacting with anonymous workers causes. This need to have a personal relationship, even if shallowly constructed, is magnified in the Silicon Valley interviews.

In Silicon Valley we asked workers to describe "a trustworthy person" and to give examples of how that trust was enacted, as well as how it could be violated. The discourse on trust carried a strong emotional component. Trust occurs when people "care" about each other and act out of motives other than self-advancement. The reasoning behind trust in Silicon Valley is remarkably coherent. Trust is designed to protect valuables both "physical and emotional." Building personal relationships is important beyond merely creating a history of professional reliability. Establishing confidentiality breeds trust. If a person divulges personal information, including opinions and perhaps even expressions of doubt about personal and organizational foibles, then trust is established when those confidences are protected. Trustworthy colleagues do not hide direct criticisms, but do not air those criticisms publicly. Instead, they put a positive "spin" on possible mistakes.

In additional to the psychological components of trustworthiness, trust embodies a series of work virtues. Technical competence is an obvious requirement. In many work practices punctuality and time consciousness are also noteworthy, particularly when finishing ones work is necessary for others to complete their tasks, especially across time zones. Waiting half a day in Dublin might delay an Australian counterpart's work for days. An ethic of accountability is cited. "Ownership" of work is lauded. People lay the groundwork for trust by taking responsibility for seeing a task through beyond a the narrowly defined scope of work. This may mean crossing internal organizational boundaries or even going beyond the company to get information or to make sure a task is completed. Predictability is also valued. Behaving as expected is a reassuring aspect of organizational life. Interpersonal skills are also part of building the trust relationship. Listening and responding to the needs of others, be they colleagues or customers, builds trust. A Dublin CEO echoed this sentiment noting, "we appear to be listening to what they're saying . . . [and the customers] like the assurance that if anything were to go wrong they can always pick up the phone and know that we would react." [Dublin 10] Paramount in building a trust relationship in Silicon Valley is having "clean motives." It is assumed that politics exists and that people have agendas, but those agendas must not derail the working relationship.

One engineer lists three components to trustworthiness—"honesty and integrity and commitment." He goes on to elaborate that he has observed these features in coworkers, by "seeing how they handle customers." He adds:

> Commitment is pretty straight forward. I mean they finish what they do. Honesty—when you work with them, they tell you straight up how things are. They are . . . given the politics factor,

they are pretty much honest about achieving a task. And they are honest about helping to achieve that task. Integrity means that they only go so far to get the job done and if it means going outside the rules or demeaning someone else, they don't do it . . . They are committed to accomplishing a task within defined boundaries and do it in an open way. [SV024]

Informants found it difficult to recite a single episode of trust. It was the product of an incremental process. In contrast, there was no difficulty in retelling stories of the breaking of trust. While many small events shaped the profile of a trustworthy soul, one episode can define an untrustworthy person.

An Indian material manager notes that "Trust is the one which you built by [making] a commitment and meeting the commitment." [Bangalore 07]. A software engineer in Silicon Valley puts it this way.

Specific instances might be hard to come by, but I feel that I trust them because I know them well, I've worked with them before, smoothly and without friction, and productively. So it's less a particular occasion where someone has come through for me, than just years of, "Yeah, this person's been there a long time, and I've never had any trouble. When things happen this guy gets things done right." A popular phrase is, "This guy gets it." [SV068]

Initializing trust is a tenuous and delicate process. The social context for creating trust was clearly different than the one for maintaining or building it. Technological mediation was a key factor. Jump starting relationships through virtual media was viewed as a difficult, if not impossible proposition. A web designer in Dublin notes:

You can't do that if the only communication you've had with them is an electronic one. Technology, I think, is brilliant for once relationships are in place. You can actually maintain those relationships. With initiating and getting to know someone there's no substitute for face to face contact . . . A lot of the signals are picked up from body language and the way a person looks at you and what not. You're never going to get that with technology. So you can't build up a true picture of their personality. Hence you won't be able to trust them until you sit in the same room with them. [Dublin 06].

A voice from Bangalore adds "In fact, E-mail actually complicates matters for these things. Sometimes when you're talking straight issues, people read [in] a lot of other things. For building trust and all these things, we have to meet or it doesn't happen . . . The trust never really gets built to a higher level." [Bangalore 04]. People think they have communicated effectively but lack the context to know they have made disastrous assumptions. Even a small amount of social context, developed over a dinner conversation or a pint of Guinness at the pub, can create a suspension of distrust.

Learning personal context beyond the tasks of the moment is essential in maintaining the relationship once it is established. This is done in various ways. Face to face contact several times a year, "lunch" and "a real talk" affirm the relationship. Once the relationship is in place a quick task oriented note, that does not have to include the context or motive, "will cut short the communication." [Bangalore 06]. Even indirect intelligence can smooth the communication. One Indian manager talks about accessing the Internet to understand the prevailing jokes made by his American counterparts. Otherwise, their references and social context are iunintelligible and "I just miss it completely." [Bangalore 04]. Effective communication takes work.

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Organizational context also plays a role in defining trust. In one Silicon Valley division, people identified an organizational dysfunction that was undergoing managerial therapy. The organization had gone through a long period of harmonious disregard for any potential problems in work processes. This meant that people had politely ignored potential problems until they became hard to change. People in that organization brought up an aspect of trust, the honest disclosure of difficulties, that generally did not spontaneously emerge. The construction of trust was specific to the local lore of that work site.

Personal identity plays a role in the construction of trust. In one Taiwanese IT company the CEO noted that as a young indigenous person he did not symbolically convey confidence to potential consumers and investors. Seniority is deeply valued in Chinese social organization. As a result they were planning to hire a middle-aged American figure-head CEO who would inspire the necessary trust.

Personal networks play a part in shaping trust interactions as well. In Taiwan, an IT worker discusses how she gives her home phone number to "trusted clients." She also trusted her family members to screen the calls for her—knowing which ones to pass on to her and which ones to delay.

Establishing trust also contains an element of cultural manipulation. One quality assurance manager in an international organization discussed how his Irishness created a link with his American counterparts.

> If you look at this little island that we have here, we call it the Island of Saints and Scholars, years and years ago, our culture lends itself to matching very, very well—we're almost chameleon like—to the American culture, and we can understand the American culture . . . and we can develop those relationships. And if you look at Ireland, for example, there's not that many Japanese companies here, but there's a hell of a lot of American companies here. And you [have to] ask yourself why is that? [Hewlett] Packard is here, Xerox is here, Intel, IBM, Motorola. [Dublin 12].

Another Irish executive went on to speculate that the very powerlessness of Ireland makes it an ideal purveyor of trust in global business. He ruminates:

> But this whole business, technology, information, security, the information age, has methods that you can do business in all of these arenas virtually shall we say, or using telecommunication technology. So, it provides great opportunities. And one of the things that we got to see going forward . . . is authenticating information. To authenticate anything, you always want to have it authenticated by a trusted method. I mean, we supply a product which issues digital certificates to individuals or people who want to trust each other. Networks of trust. . . . somebody in Argentina, . . . if they want to do business with somebody in New Zealand, how do they actually verify their network of trust? How do they know? The guy in New Zealand may want to meet all of your family. It's a bit like the difference before you get married when you're meeting different potential partners. Some of them will want you to meet the parent's early. Some of them won't want you to meet the parents at all. And who makes the call? . . . I trust a 3rd party can do it . . . You could have a trusted 3rd party in a small country which is traditionally independent and neutral and no major allegiances at the cutting edge of technology, say, like Ireland, to act as that kind of hub for almost all global [e-commerce].[Dublin 03].

The flow of information that simultaneously necessitates and builds trust is not without disruptions and conflicts. Poor infrastructure may sabotage reliability, no matter how worthy the intentions. One manager in

Bangalore discusses the need to establish trust and reliability in a climate where the post, the telephone system and transportation were unpredictable. Building trust included being able to predict or at least manage the failures of the system and find ways to communicate glitches to customers and coworkers. Building a network helped, but is not sufficient to make the post run on time, but is reduces the consequences of failure.

People move within and between organizations for a variety of reasons, including corporate reorganization, expansion and demise. Individual workers also may be promoted or simply job surf. This is particularly prevalent in Silicon Valley with its 8,000 high tech organizations. International relocation poses particular problems in maintaining trust relationships. People disappear from the social network. However, those same people may reappear electronically and once again grant access to information, but that is not a given.

Building social relationships to customers can be a tricky proposition. A manager in Hsinchu, Taiwan reflected on the inherent difficulty in information disclosure. He notes:

> Because high speed networks develop very fast, we need to know the status of our company. I will collect the competitors' product information, test their products and generate our benchmark report. We will provide [two] benchmark reports. One is our inside reference and the other is [for] our customer. I will show [the customers] our advantage and then I will hide the report. (He laughs) I will hide the drawbacks and tell them it's good, good, good, good, always it's good. But inside I will always [think] drawback, drawback, drawback. [Taiwan 11]

Open communications with customers also poses cultural difficulties. Realpolitik dictates diplomatic communications. When a PRC customer makes jokes to a Taiwanese about his need to learn to swim, tacitly boasting about the naval superiority of the PRC, he keeps his peace. He notes, "The customer is first, so we can say nothing . . . You should handle your business relationships like this. So it's a social relationship" [Taiwan 11]. Trust must be constructed knowing the inequalities which creates barriers to be negotiated.

Even if international politics do not interfere, corporate politics potentially sabotage trust relationships. Repeatedly our Silicon Valley informant warn us of the dangers of the "hidden agenda." A marketing program manager at a major Silicon Valley corporation notes the inherent contradiction. People are constantly "in an environment where, myself included, we ARE selling [ourselves] all the time . . . We do have our agendas. We have our own goals. We all have our own things that we're working on." [SV105] Yet those agendas must not undermine the network of reciprocal favors that support the trust building relationships.

In complex organizations with international components hidden agendas force a reaction of self-protection that sabotages trust. An Irish manager notes, "[The other divisions] may have hidden agendas that may not suit what you're doing. Like if they were out for themselves, I'd be looking to do what's right for [the corporation in] Europe, here. If they were out for their own personal achievements and goals, then that's somebody else, you couldn't build the same level of relationship." [Dublin 12]. A Silicon Valley admin describes her relationship with her supervisor, a master of hidden agendas, "like one of those little slinky spiral things" [SV064], that just keeps looping around preventing action. Sabotaging competent and effective production is a grave violation of work ethic embodied in trust.

Another grim political reality overshadows the trust relationship of worker to organization. Downsized several times, one engineer notes that "As much as a company likes to feel it's a big happy family—it's not a family, it's a business." [SV068] That is a reality he has learned to accept. He cannot trust the organization to employ him, but he can hope they will act openly and responsibly in the inevitable betrayal.

Not all workers can maintain the complex dance of network building and trust maintenance. One Silicon Valley worker notes matter of factly that he trusts no one except his cat and his computer. "It's not a concept that I have . . . My cat's about the only thing, my computer, yeh they're trustworthy because if they break I know why. I can usually figure out they're gonna break just on their own randomness. No, people tend to uh, I don't see [trust] as a value in people. I don't hold that in esteem and at the same time I don't think I even look for it." [SV029]

The comparative component arouses us to ask different questions than a single focus might yield. High tech work is done by networks of interdependent global workers that must share information, act under a severe time constraint, and establish effective relationships at a distance. This is the common engine that generates trust as a social phenomenon. However, simply examining Silicon Valley "trust" would not have sensitized us to the role of identity in forming trust, using Irishness or Chineseness to create an image of trustworthiness. The comparative perspective allowed us to see that power was a key factor in how trust is enacted and defined. Viewed on from Silicon Valley, currently the premier technofied community, the effect of power would have been invisible, but taken for granted. Power is more easily seen from below. It allowed us to see that differing social and technical infrastructures might shape the way trust is built and maintained. It also emphasized the problematic nature of technologically mediated relationships, since networks built at a distance and maintained virtually have risks that local networks do not. This hierarchy of secure networks, from local to distant, help us understand the social dynamics of technofied community.