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Rites of Production: Technopoles and the Theater of Work

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Abstract

Ambiguities in the nature and practice of work, especially knowledge work, moral work ethics and fluidity of work space drive a need to communicate productivity to other workers. The knowledge work done in silicon places is often intangible and requires some creative narrative "accounting" to demonstrate competence, trustworthiness, and value to the community at large. This hidden work is imbedded in worker activities and communications, corporate evangelism and community boosterism. Ethnographic research done in Silicon Valley, Taipei, Taiwan, Dublin, Ireland and Christchurch, New Zealand explores how such performances are an integral part of high-tech work and the communities that house such work.

“And, as imagination bodies forth
The forms of things unknown, the poet’s pen
Turns them to shapes, and gives to airy nothing
A local habitation and a name.”

(Theseus, *A Midsummer Night’s Dream*, Shakespeare 1947:297; also Nardi and Whittaker 2002:4)

“Some believed that we lacked the programming language to describe your perfect world. But I believe that as a species, human beings define their reality through misery and suffering.” (Agent Smith, *The Matrix*, Larry and Andy Wachowski 2003: n.p.)

Prologue: The inherent intangibility of knowledge work

Workers in silicon places face ambiguities piled upon ambiguities in their everyday work lives. First, the very nature of work has shifted. What counts as work has become ambiguous, diverse and subject to interpretation. Work, of course, continues to be comprised of accountable productive tasks. Increasingly, however, it is merged with many other activities. Workers must develop and nurture an infrastructure that allows them to complete their tasks--collecting and organizing objects, building, maintaining, or pruning relationships and allocating or modifying resources. This is hidden work, necessary, difficult to track, and not strictly productive. Intelligence must be gathered about things, people, places and rhythms. Work is also a social production, a form of theater, meant to be viewed by others. Some theater demonstrates productivity, showing people that work is being done. Other performances are moral,

demonstrating that one is worthy of trust and deserving of reciprocal exchanges of information, services and materials. Then, there is the hidden work of going from one context to another, shifting between these different kinds of work. What work is being done at any one time? Second, knowledge work, existing in the imaginations of workers, is particularly difficult to pin down. What is going on in that engineer's mind? Third, it is difficult in a multicultural, global and complex workforce to assess morality. What is a good worker? By whose standards do we judge? Finally, physical space itself has become fluid and ambiguous as distributed work makes uncertain whether one is working in a defined workplace, at home, or across the planet. Where are we, and therefore, who are we? If I do not know where I will be, or where my workmates are located, how can I contextualize the work that we are doing?¹

Reacting to this uncertainty, workers engage in social theater, in the "rites" of production. Applying the concepts of ritual and performance to work is problematic. As Auslander notes, since the seventeenth century work was conceptualized as rational, while ritual was to be contained in the religious and domestic spheres. Modern work practices, however, are "among the most complex ritual systems ever developed, all the more powerful for their seeming transparency and naturalness (2003: 4). The social and moral dimensions are especially part of work in silicon places, technopoles, since cooperative work practices are expected to produce "milieux of innovation." Such an environment is meant to generate synergy and maximize a particularly illusive kind of productivity, imaginative productivity (Castells and Hall 1994: 9). This sort of work is difficult to track. In the field of accounting, what is counted is translated at the individual level into human resource performance reviews, reifying how people know what has been produced at work, breaking down cultural practices into comprehensible unitsXperformance goals

met, widgets produced, division revenue earned, GNP. Yet many of these narratives of accountability are rooted in economic systems that are marked by the material world of agricultural production and manufacture. Accountability is more ambiguous when applied to the world of knowledge work. Jeff, is a reflective software engineer whose insights will contribute much to this paper. In talking about work, he waxes eloquent about Fry's Electronics, a local grocery chain that reinvented itself as a technology superstore. He says, "Fry's is like home away from home. The week doesn't go by we don't have a reason to go to Fry's. I'm not proud of that, but it's a fact of life." He talks about a joking, but valid e-mail that made the rounds, saying, 'You know you're living in Silicon Valley if you think that leaving work to go to Fry's is a perfectly good excuse, and your boss agrees.' It's true. 'See ya later boss. I gotta go to Fry's.'" Is he working when he goes to Fry's? Who decides and how can he demonstrate it?

Academics have long experienced this dilemma. The anti-intellectualism of Joseph McCarthy or Jesse Helms reflects an ethos that makes the "common man" the icon and highlights the esoteric nature of intellectual work. In twentieth century China, scholars have intermittently been viewed with deep suspicion. Chinese peasants refer to intellectual work as the scurrying of insects. It was only when academic researchers were reframed as *zhishifenzi*, thought workers, could they be seen as real workers (English-Lueck 1997: 40-42). It is problematic to track and communicate the value of work that is not physically productive.

Building Hidden Infrastructure

Part of building the innovation milieux associated with technopoles, silicon places, is social networking. The ability to build and harness social connections has been tracked and

identified as a critical asset for Silicon Valley (Castella et al. 2000; Saxenian 1994). Learning, teaching, communicating with coworkers, maintaining contact with purveyors of knowledge in the network, but outside the company, and building relationships are all part of a hidden infrastructure that must be maintained to do knowledge work, but which does not easily fit into an accounting structure. Networking still consumes work time, especially for people who must constantly refresh their knowledge to produce competently. Jeff, a software engineer in Silicon Valley, has reinvented himself several times. He began work in a particular proprietary computer platform, one that has waxed, waned and waxed again. His expertise in that platform continues to be an asset in developing software applications. Jeff relates a parable that reinforces social nature of high-tech work. His tale underscores the high levels of creativity and ambiguity necessary to work:

It turns out that there's functionality that they want, that has to be done specially for the [platform]. And they involve these problem domains that I don't understand. So I have no idea how to accomplish what they've asked me to do! And I have to start totally from scratch and find out who can teach me and who can show me example code. Where can I learn about this? Is there anybody else's work I can leverage and use? That's very uphill. And at the start of it, [it's] especially, very frustrating because I had no idea where to grab. It's like someone came to you and said, 'Oh, by the way, I need you to run out and buy a fiddlywidget. Make sure that it's a good one and I need it by three o'clock and don't spend too much,' and then he runs away! What the heck is a fiddlywidget, who sells them, what's the price range, how do I tell a good one from a bad one? Where do you start? It's difficult. So I go find my boss and I say, 'Who knows about fiddlywidgets?' 'Not me, Fred knows. Go

ask Fred.’ ‘Not me, but you know, Andy knows something about it.’ ‘Oh yeah, I did fiddlywidgets, but I did ‘em for DOS ten years ago, you know. So and so knows more about it now.’ About that time, you find someone who says, ‘Oh, you don't want a fiddlywidget. You want a whatzit.’ ‘What's a whatzit?’ And you start over. Sooner or later you get your feet under you and then you can get something done, but having these things thrown out of left field is very frustrating. You wind up learning something, and that's a good thing...

Jeff goes on to relate a practice inherent in group software design. In writing code each person is contributing to the larger effort, but it would be chaos if this were done in a disorganized way. So a central repository, “a golden source” is created that each person can work with using a control system. This makes each person accountable for changes made. The system is locked while one person is working on it, and should be unlocked at the end. The system “drives the need to get intelligence on who is ‘locking’ the code.” Jeff adds, “Sometimes the lock doesn’t get released, and you call up the next day and the guy says, ‘Oh my gosh! I'm sorry!’= So you have to work with people, and you have to work with the machine.”

This hidden infrastructure work merges with theatrical work, in which people demonstrate their competence and create narratives through action, work and material culture that explain or account for their time on the job. The intangible must be made tangible. Worker activitiesXaccomplishments and plans are the building block of reputation. Individual people and organizations make milestones and mission statements. The articulated goals form the basis for monitoring workers from above and accounting for

time from below. Worker relationships and communications build interactive networks of trust. Yang, a young engineer in wireless communication in Taiwan, after he has exhausted his coworkers knowledge, will then consult one of his former classmates, who coincidentally is working for a competitor. He chats with him informally and gets the missing piece of his technical puzzle from him. Both know that their relationship is one of balanced reciprocity. Next time it might be his friend who needs that hidden bit of knowledge. Workplace artifacts are tangible displays of interest and potential competence. Products, including those that have never been brought to market, adorn cubicle walls. Pictures of coworkers, of projects long done, communicate demonstrated teamwork and convey the moral authority of loyalty and may be clues to unknown network connections.

So far, the examples illustrate a sort of group interaction directly related to production. Networking, however, is more subtle. Not all interactions are directly productive, but they still contribute to the overall “milieux of innovation.”

Jeff also provides examples of how connection in one domain—family, music, or generic techno-lust—provide a basis on which to build productive relationships. Jeff has formed a relationship with Jason at the workplace. Both love music and are personal digital assistant, PDA, enthusiasts. Both write shareware in their “off” hours as a supplementary source of income. Long before they ever had to work together they had created a relationship around these other interests. When they did finally have to work together Jeff notes, “I didn't have to establish myself with him; I didn't have to figure out who he was. And I know that if he hears something that he thinks might help me, because he's a good buddy it'll stick in his mind and he'll tell me about it. He'll remember that more easily and more willingly than he would for somebody he only talks to about

business--and that rarely. I mean, there's an old cynical saying, 'It's not what you know, it's who you know.' And there's a non-cynical way in which it's perfectly true and valid." With this in mind Jeff cultivates his own network. Jeff writes his own gaming shareware and together he and his wife promote the business in the late hours of the evening. He has a circle of friends that consist of engineers and people involved in shareware from far flung places. He stays in communication with them over e-mail and through mailing lists, but he laments that the opportunities for face-to-face interaction are sparse. There is the tradition of the Netter's Dinner, where people can meet for a meal while attending the annual conference, but that is a large and unfocused gathering. So Jeff and his family host a get together at their home, also coinciding with the annual developer's conference. Two dozen people who share their passion for a particular computer platform and a commitment to shareware meet the Saturday after the conference, by invitation only. Months of planning precede the event. Most of the invitees are from Australia, many can contribute to the family business, and activities range from intense "geek talk" to backyard play. The event, Jeff notes, is not merely instrumental, "I'm not trying to breeze in and show them that I'm Batman out of costume and that's why they want to hire me; I want to be a friend. I want to sit down and have a good chat with them, have a good time." Jeff's and Yang's activities and relationships are work-related, but in the larger system of accountability, however useful they might prove to be to an employer, would not be considered work.

Theaters for the Rites of Production

What gets counted as work? By whom? For whom? What is the "Unit of Accountability?" This is particularly difficult to reckon in distributed work practices. Work is linked to yet another

area of fluxXplace. Work is done in multiple worksites, and the association of work and place is unstable as the theater for the rites of production shifts. The individual, the team, the division, the company, the nation, the silicon site, all exist in flux, sometimes functioning in diverse spaces or electronic space, sometimes firmly rooted to the identity of a particular location. Nardi and Whittaker had intensely studies distributed work and note that the foundation of such work is the establishment of social relationships, often based in face-to-face relationships (2002). Reputation and trust are painstakingly constructed in a complex web of relationships that are enacted in physical and electronically mediated space (English-Lueck and Saveri 2001).

Susan illustrates how place, networking and activity can be merged to make a case for accountable work. Susan is actually a physicist, but she has become a de facto magnet engineer at a national laboratory. She consults with literally hundreds of people in various projects, tracking them carefully in time and space. Yet, her primary space, her governmental issue office, is dominated by other facets of her “work.” As a senior person and a woman, she considers outreach through non-profit work for women part of her mandate as a scientist. Central to her efforts is the Math/Science Network which “encourages young women to consider math and science careers, especially by focusing on the young women in the middle of high school.” She has worked with their conference, “Expanding Your Horizons,” and has been “on the board since 1981.” Pointing to a section of her office, she notes, “This is all Math/Science Network stuff. I'm known as the bag lady--I have bags, and every project . . . gets its bag. There is a fund raising bag, and a general bag here. I've been president. I've been treasurer. I've been vice-president. Right now I'm just a plain board member working on fund raising, and . . . the Association for Women in Science has a strong Palo Alto chapter that was started in 1985, so I've been going to their chapter meetings . . . I agreed

to run their mentoring program. They have a mentoring program where more established women scientists mentor graduate students, women graduate students at Stanford University, so right now I have two protégés.” She supports the Women=s Philharmonic in San Francisco and has used her analytical expertise to dissect their audience surveys. She is a member of NOW and Older Women's League. She “raises consciousness” by being a working older mother, a consulting co-parent, discussing family strategies with her colleagues in the profession and at the lab. She conducts workshops in the laboratory and her activism and work are thoroughly intermixed. She connects “bags” of tasks to relationships to places to work. In this way, she refashions the ambiguity of her position to her advantage, creating social capital for herself, the laboratory and the community.

In our project on work, identity and community, Darrah, Freeman, and I actively asked workers about how they develop trust and construct reputations. In our other fieldwork in Silicon Valley, Dublin, Taipei, Bangalore and Christchurch, we did not ask about trust directly, but were struck by spontaneous discussions or actions that revealed how trust and reputation were enacted (English-Lueck, Darrah and Saveri 2002). There was cross-cultural variation, but several common themes emerged. Trust and reputation come from perceptions of competence, affect and identity.

Workers ask, “Can those people do what they say they can?” Do they have the right attitude towards work and coworkers? Can we use our identities, who we are--as Motorolans or as Kiwis--to enhance our reputations?

Competence in Silicon Valley is based on a history of productivity. One has to demonstrate that one can do what one claims, simultaneously folding in discourse that evokes efficiency and network savvy. This network-savvy theme was found elsewhere. In the words of John, an

entrepreneur in Dublin, Ireland, networking is essential to establishing an identity in Silicon Valley. He calls it “the Silicon Valley two-step. Just dance with everybody and eventually you are a player.” Reputations must be carefully constructed, especially where credentials do not convey an obvious “brand.” For example, Linda and Arthur, two attorneys in Silicon Valley I observed, had to connect to their high-tech clients and convey a sense of competence that is based on more than their knowledge and practice of law. Attorneys routinely use WordPerfect, a fact for which they are frequently teased by their high-tech clients. Phone savvy and walls of books on case law, artifacts that once conveyed a message of legal competence, are less convincing to high-tech clients for whom a good website and visible user competence with online databases and e-mail communication is considered mandatory. Those clients demand displays of efficiency and technical prowess. Roy, an executive I shadowed, has gone through several reinventions, a technical metaphor popular in Silicon Valley. His academic background was in physics, but early on he developed competence in computer use. He converted these skills into sales and managerial experience in the early days of Silicon Valley. He used his familiarity with science and engineering to colonize a niche in management, rising through the ranks to become CEO, Chief Executive Officer, of a networking test company. As I was observing him, he jumped from the telecom industry to become the COO, Chief Operating Officer, of a biotech firm. He took tutoring in genetics so he could understand the content end of the position, and reshaped the structure of the meetings to convey that he understood both the culture of science and the need for profitable productivity. When one of the scientists in his group talked about the need to reduce signal to noise factors in managing rumors, he picked up on the metaphor, signaling his own technological and scientific savvy. Both the attorneys and the executive had to enact “techno-theater” to enhance

their reputations with clients and coworkers.

The narratives of competence also carry a moral valence. Nathan is a linguist who became a software engineer. He talks about the need for trust and relationships in his work, emphasizing that it is *not* solitary work. He remarks, “Someone’s . . . trustworthy in terms of their work product. You know that their work product is always high-quality and good enough to be relied on. With software, there are no lone wolves; it’s a team effort and what you’re doing ties into someone else and what someone else is doing ties in with whatever everyone else is doing so what everyone does has to be good enough to show to other people generally. That means that their analysis and their design and their execution make the right set of compromises. That’s trustworthy. There are other kinds of trustworthy too. Your lunch partner—you can trust him not to say the wrong thing to different people. If [people] sit down at the table with you and they don’t say bad things about their group even if they’re thinking it then they are trustworthy.” Loyalty is intertwined with conceptions of trust.

Clare, an engineer, has carpal tunnel syndrome. She made technical accommodations, but most of her adaptations are behavioral. She no longer camps, or cooks. She minimizes her use of personal e-mail. She does not use the personal digital assistant she helped to develop since it is too awkward for her to use and carry. She wears wrist braces. In a poignant moment after the interview officially ended, she held up her hands and said, “I save these for [my company.]” Her devotion was made manifest in her behavior.

In high-tech corporations even the casual dress of engineers is carefully crafted. Not too shabby, since that would convey an inability to care for oneself, nor a “suit,” which would be worn by people with power but without technical competence. The “casual dress” worn is an identity

marker and class statement.

Companies are adept at theatrical productions. Apple's corporate evangelism is designed not only to make people think of Apple products, but to remind producers and consumers alike that it is the company that admonishes people ungrammatically to *Athink different*.≡ It represents a political and moral stance, not just a product line. Linux fans cite the stability of the operating system as an asset, but also note that it provides a moral alternative to Microsoft hegemony.

The theater of busyness is a major rite of production. In Chinese, "*n0 máng ma?*," "Are you busy?" is a standard query, a social cue that gives the respondent an opportunity to make it clear that no one is more important than the person asking the question. It is the height of rudeness to respond in the affirmative to that query. However, busyness is essential to the theater of productivity. At her high-tech company, Barbara trains incoming administrative assistants to "look busy." Organizing is invisible, though essential part of knowledge work. It is confined to the internal thought processes of the worker. Shuffling papers and using devices makes that organizational work visible theater for coworkers and managers to appreciate. Much of the theater of productivity is spent doing things, talking busyness, looking harried. To look too serene or relaxed might be misinterpreted as not having enough to do. In Aaron's software company, there is an unofficial award, the "Timex Award," that highlights the workaholic dedication that is officially disavowed, but tacitly rewarded. Aaron says the winner was selected "because he had the most and the worst symptoms of anybody else and he got the Timex Watch Award, and it says 'Takes a licking and keeps on ticking.' That happens a lot." He goes on to discuss his own back problems, and how, in developing one product, all the members of the team gained around twenty pounds. Yet, the suffering, visible to all coworkers, was turned into a badge of honor. The need

for the pain is resented, particularly if it comes from “the things that they deem unnecessary or counterproductive that causes them to need to do more.” The pain is associated with the need to push hard, to keep up with the harried product cycles, a scenario workers talk about emphasizing the dramatic heroic implications.

All of these examples have operated at the level of individuals imbedded in various work organizations, however, one of the advantages of having done cross-cultural comparative work is to see how the discourse of location, of place and identity, becomes the discourse of productivity. One of the interesting implications of being a silicon place is that individuals and companies are not alone in seeking a reputation in the industry. Whole communities, urban cross-roads, search for ways to reinvent themselves with the silicon brand. Merge Asilicon \cong with the appropriate geographic feature and a potential reputation of technical prowess emerges. As communities enter this process of “branding” the interesting question for social scientists to ask is “what do the various communities choose to emphasize?” Who are the stakeholders that promote or oppose the “silicon designation?” How is culture used to augment the “reputation for technical competence that being in a silicon place imparts?”

The original Silicon Valley is carefully marketed by industrial stakeholders, parties in government responsible for economic development, and the media. This community boosterism is best illustrated by Joint Venture: Silicon Valley Network. This is a public private partnership, which I sometimes refer to as a postmodern example of a company town, designed to “reinvent” the region to make it an effective platform for sustainable, high-tech based industrial and economic growth. It was born in the early nineties in last recession, when it was unclear whether Silicon Valley could sustain its prominence in light of competition from places like Austin and Singapore.

Education would be retooled, as would local municipal regulations, to make the region the paramount innovator in the world. The Mercury News, the region's newspaper, formed a Silicon Valley news group to track and promote that identity. San Jose State University became the Metropolitan University of Silicon Valley (since it produced most of the region's engineers), and organization after organization became the "[fill in the blank] of Silicon Valley." The Tech Museum of Innovation was an integral part of this effort, making manifest the mysteries of high-tech work from clean-rooms to forensic investigation. Visitors to the Tech would inform their families, "This is what I do at work," making transparent that which had been previously opaque. Slogans of innovation mark the walls of the large blue and mango-colored structure. Children are encouraged to discover technology with hands-on activities. Corporate sponsorship trickles into consciousness in visible small plaques near exhibits or floods into mind as one gazes at the mythic wall-sized photograph of Hewlett and Packard's garage. Along with Fry's Electronics, the Tech has become an icon of technological theatricality.

The Taipei/Hsinchu corridor in Taiwan uses its cultural ambiguity to convey its emerging silicon identity. Trade shows, an alien cultural form, and other transnational interactions must be used to convey a message of competence to overcome Taiwan's distinct disadvantages. Taiwan is politically vulnerable, a state without a nation, and it has been relegated to the technical backwaters. Initially, its very success as a personal computer and technical product producer overshadowed its potential as an innovator. While I was working in Hong Kong in the mid-nineties, I ran into Chinese sojourners, "astronauts" from Silicon Valley, who felt shunted into the category Atechno-coolies.≡ Taiwan has labored against that reputation, using its historical cultural ambiguity to its advantage. Just as Dublin and Christchurch use their English-language prowess

as an international asset, Taiwan uses its relatively recent historic legacy of Mandarin to connect to the market in the People's Republic of China. Once a Japanese colony, it can also use the models of production and the relatively common use of Japanese language to connect to Japan. Taiwan uses its position vis-a-vis constant influxes of American culture, and intermittent bouts of American social and political support, to connect to the United States. Taiwanese, especially in the younger cohort, are conscious manipulators of cultural competence, creating strategic connections to the powers that be. This flexibility underpins the technical and economic connections to the three giants—the People's Republic of China, Japan and the United States, that can be leveraged in developing a high-tech niche for Taiwan.

Dublin, in a parallel way, has used its legacy of education and English-language fluency, in conjunction with its role in the EU, to build an infrastructure that fosters high-tech growth. Multinational corporations have harnessed this asset, but it is in the indigenous software companies that careful niche growth is clearly evident. Ireland can market itself as a trusted partner, free of the historic baggage born by many political giants. Tim, another Irish high-tech executive, speculates 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 so that you can do business in all of these arenas virtually, shall we say, 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 ...before you get married when you're meeting different potential partners. Some of them will want you to meet the parents early. Some of them won't want you to meet the parents at all. And who makes the call? . . . 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].

New Zealand, a relatively new player in the Silicon Valley two-step, must establish its reputation with considerable constraints. It is small, the size of California, with the total national population of California's Bay Area. New Zealanders are conscious of being at the ends of the Earth, the first stop out of Antarctica. While sheep no longer outnumber people nineteen to one, harnessing its economy to "the Knowledge Wave," as the national government likes to call it, will be a challenge. Strategically, the government hopes that internet commerce, software development and high-value small-to-ship technologies will be the "freezer ships of the 21st century," referring to the technology that allowed New Zealand to be associated with lamb dinners throughout the British Empire. Like Ireland, it has an educated English-speaking population and have transnational ties throughout the English-speaking world. This transnationalism is fueled by a tradition of OE, Overseas Experience, as well as a student loan policy that drives its graduates offshore. In the late

nineties the government in Wellington particularly pushed the city of Auckland's North Shore into becoming "Silicon Bay." Auckland houses one of the major University engineering departments and it is the primary population center in the country. However, Christchurch, on the South Island, evolved into what Castells and Hall call a "semi-spontaneous technopole." It developed its own silicon identity, Silicon Plains, with only a nudge from the local city council, itself occasionally referred to as the "People's Republic of Christchurch." Canterbury University, a major academic organization, and Lincoln University, a more applied institution, produced networks of young entrepreneurial techies (see Titus 2002: 83). Several indigenous electronics firms set the stage, followed by software production and internet commerce. Multinational corporations have played a relatively minor role in this development, most innovation has been housed in indigenous companies who grew until they reached a threshold and were then sold to larger global players. Just as Silicon Valley was promoted as a journalistic device in 1972, the Canterbury region's "Silicon Plains" identity is amplified by "success story" columns in the local newspaper, The Press, and by weekly networking events--Techie BBQs organized by several tech-journalists and writers. Tech Breakfasts hosted by Trade New Zealand, further augmented networking opportunities and promote community identity. Parallel to the garage myth of Silicon Valley's Hewlett, Packard, Jobs and Wozniak, there were stories of "kiwi quirkiness," the frontier spirit of innovation embodied in being able to fix anything with "number eight fencing wire" (see Hopkins 2000). It is the home of Ernest Rutherford, physicist and "Kiwi genius" (Smith 2000). Add the story of the famously innovative Britten racing motorcycle, built by a Christchurch local, a motorcycle built and

designed from scratch (sportsbikeworld 2000), and the success of Wellington's Peter Jackson with his highly technical approach to cinema and the pieces begin to form a cultural narrative demonstrating innovation and competence.

The theater of technical competence is played out at the national level--witness the efforts of ANZATEC and Trade New Zealand in promoting a silicon identity for New Zealand. It is also played out at the micro-level, as people strive to create and occupy technical niches. In Christchurch, Athena works multiple roles; she is a general go-fer in a software firm by day, a worker in a Greek restaurant that serves as the basis of local nerd networking by night, and online entrepreneur of used clothing in her off hours. She carefully works online bulletin boards to convey an important message--she is from the big city of Christchurch and has the style and wherewithal to get good clothes and sell them online to women in small towns and stations throughout rural New Zealand. Other entrepreneurs cautiously expressed that while Christchurch would not be the site of new paradigm shattering technologies. Kiwi innovators are quick to find applications in distinct niches, seeing new uses for devices. Examples cited for this niche included translating the air bag sensors in cars to innovative low-cost seismic detection devices, or turning code for recovering lost data into a powerful encryption programs that can reproduce keystrokes. However, efforts to create a silicon identity for New Zealand face significant cultural barriers. At Trade New Zealand, Sandra, a government worker charged with promoting the technology sector, notes that it is difficult to create a viable national brand. Microscopic divisions between North and South Islanders, Kiwis and Australians, and people from English-speaking countries and mysterious and dangerous Asian others interfere with global interactions and national marketing.

Conclusion

Because knowledge work, especially technical work, is inherently interdependent, even the nerd in the back must work with other nerds in the back. Building a trusted reputation is a vital part of the hidden work that must be done to be effective. Modern work, especially knowledge work is also opaque, difficult to demonstrate, or even identify, in daily work practice. It is simultaneously conducted in fluid locations, including cyberspace, and also rooted in real geography. It is slippery stuff. This combination of factors make it necessary to enact a theater of productivity to account for one's work. Like so much of culture, this process is going on simultaneously at a number of levels. Individuals are working to establish their business credentials, while communities themselves build myths, enact rituals, and struggle to develop identities that communicate technical competence and inventiveness. This use of identity as an economic tactic opens up interesting areas for investigation. How is this emerging version of community enacted in everyday life? Which parts are adopted? Which parts are resisted? What happens to the people who do not fit into the assigned role or who do not want to be part of that particular play?

Endnotes

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