Constructing Working Selves:  
**Silicon Valley Assemblers Meet the New Work Order**

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**Introduction: Manufacturing Men**

Early in twentieth-century America, Henry Ford, that famous industrialist and manufacturer of the Model-T, is said to have claimed: "I am more a manufacturer of men than of automobiles" (Schwartz 1971). And indeed, one arm of the early Ford Motor Company took as its purpose adapting an immigrant workforce to new conditions of production. By the second decade of the 1900's, work at the Ford factory had become synonymous with assembly-line mass production and required of workers minimal skills and decreased mechanical know-how. Nonetheless, with the demand for the Model-T growing, worry abounded that the available immigrant workforce from southern and eastern Europe was too undisciplined, too unreliable, too inefficient to succeed at the factory regimen (Meyer 1980). These workers needed to be recast, thought Ford—transformed morally and socially, made fit for a new work order. And thus were born several ambitious educational and socialization programs for Ford workers, programs that taught virtues such as "timeliness, cleanliness, thrift, self-discipline, regularity" (Meyer 1980: 75).¹

I use this account of the Ford English School to introduce my research on work, literacy, and identity, studies carried out in a very different context and historical moment, but at a place and in a time which demonstrate certain continuities with the earlier account. At our end of the century, we have heralded another new work order, one this one with global proportions and consequences, but perhaps nowhere so visible as the Silicon Valley of Northern California. There is, of course, a great to do these days about the changing nature of work. It seems that, not only have the old industrial, assembly line jobs from the Ford era and what Zuboff (1988) called "sentient" work largely disappeared, but that we can also look forward to the death of the traditional concept of a job. On the negative side, the prediction is that in the near future most work will be temporary, and that people will have to piece together patches of employment, gleaned from this and that employer, into a crazy quilt of a working life. (A recent report bears this out: Only a third of California workers now hold a single, full-time, year round job; see the *California Work and Health Survey* 1999.) On the positive side, the new work is said to allow rank-and-file employees to make the kinds of operating decisions that used to be reserved for management, to require of them more technical and communicative know-how, and to give them access to the information and training they need to perform at the highest levels. So, the new work order promises to provide employment that is not only different and in some ways more stressful, but potentially more satisfying as well (Appelbaum and Batt 1993).

What I hope to demonstrate in this article is that it is useful to conceptualize new workplaces, not only as requiring particular types of skills and knowledge, as we are so frequently told in the popular discourse on "high performance" workplaces (cf. Darrah 1996; Hull 1993), but also as constructing new workers or people who have a different sense of themselves, a revised identity, complete with new social practices, or ways of acting, talking, interacting, valuing, and using tools and technologies (Gee, Hull, and Lankshear 1996). Indeed, we can best think of technical and textual practices at work and elsewhere as part and parcel of social practices, including the interpretation and enactment of notions of self. In the same way, then, that Henry Ford wanted to socialize immigrants to the US at the turn of the century—to Americanize them into certain middle class values—there is a related effort today to manufacture certain kinds of people as workers—who think of themselves as, act and think and feel like, and adopt the values of problem-solvers and team-players, symbol analysts and information manipulators.

My second point will be that, despite attempts to re-engineer workplaces and to create particular kinds of workers, people do find ways to shape work requirements to their own ends, to resist and even at times to transform the definitions of self and worker that are being promoted. Identities, I want to illustrate, based on data collected during three years of participant observation at two circuit board assembly factories in the Silicon Valley (for the larger study see Hull, Jury, Ziv, and Katz 1996), can to varying extents be claimed, modified, rejected, or ignored, and people can also themselves have a bit of an effect on the culture that is shaping them (cf. Eishenhart 1995; Holland, Lachicotte, Skinner, and Cain 1998). Just as Henry Ford's workers proved ever so recalcitrant in holding on to certain valued cultural practices while they simultaneously complied with the curriculum in Ford's English School, the frontline workers in Silicon Valley that I came to know demonstrated great resilience and ingenuity in attempting to craft working selves that both satisfied the expectations of their employer, but that also honored their own histories and, at least in some ways furthered their own goals and plans for the future. In other words, when presented with their company's notions of high-tech work as being good people of a particular sort doing their bit to advance a new work order, these frontline workers developed, negotiated, and enacted local definitions of "good worker." Their stances provide an
interesting challenge to the view of high tech work as providing a transcendent identity, an offer of self and future that cannot be refused.

Valley of Dollars, Valley of Heart’s Delight

Riding South on Interstate 880 from Oakland, CA, the temperature and the scenery gradually change. The deeper one goes into the Santa Clara Valley and the farther away from the San Francisco Bay, the hotter and sunnier it gets. The Diablo Mountain Range is always in view in the distance, but the immediate landscape becomes quickly dominated by miles and miles of well-kept sprawl: cheerful-looking stucco buildings with names recognizable the whole world over—Intel, Sun, Flextronics, Hewlett-Packard, Lextron, Apple, Silicon Graphics. This is the Silicon Valley, and although one can find examples of industries and businesses other than electronics here, this twenty-five mile strip of the San Francisco peninsula belongs to the design and manufacture of computer boards, chips, and components and an explosion of internet-related dot.com enterprise. It is hard to believe that all these miles of buildings and parking lots with well-over 2000 high-tech companies were, as late as the 1940’s, orchards of apricots and walnuts, and known as “the Valley of Heart’s Delight.”

The Silicon Valley is regularly held up as a major economic success story in the United States. Along with its electronic and economic bonanza, a mythology surrounds around the Valley, legendary tales of “making it” and making it big. Hearing them, it is hard to sort fact from fiction, so fantastic do the accounts seem. Much has been written about the first generation of young entrepreneurs, the founders of companies like Apple and Hewlett-Packard, who parlayed into multi-million dollar enterprises the considerable technical know-how they had garnered at local universities like Stanford and Berkeley. These entrepreneurs are said to have constructed, and been influenced by, a unique local industrial environment, where fierce competition operated within a collegial atmosphere of inter-firm cooperation and networking (Saxenian 1994). But these founders of Silicon Valley were just the beginning, and now they seem even a pedestrian start. Most recently, a whole other generation has come to the Valley to cash in on an economic boom the likes of which has not been seen. Incredibly, a quarter-million “siliconillionaires” currently live in the Valley, and hordes of young hopefuls arrive daily, ready to pound the pavement in search of the venture capitalists who will provide the wheels to spin their ideas into gold. Dot.com mania and a stock market bonanza have recently fueled frenetic and unimaginably luxurious life styles, chronicled in books like Bronson’s The Nudist on the Late Shift and Other True Tales of Silicon Valley (1999), and Kaplan’s The Silicon Boys and their Valley of Dreams (1999). Reading such accounts, we begin to construct a dizzying image of entrepreneurs, technical wizards, visionaries, and business wonks—seemingly all young, all driven, all ready to work twenty hours a day and doze the remaining four curled under their computers, in hopeful expectation of making their first billion before they turn thirty. What interesting notions of working identities these images suggest, images that beckon siren-like for others to join, not just a work world, but a grand endeavor, a value system, a way of being.

Mostly missing from this picture, but the focus of this article, is the front-line worker. It is important to note that conversations about the success and development of the Valley (and no doubt other regions in the US and beyond) can and do take place with scanty reference to eighty percent of the workforce, the men and women on the lower tiers who manufacture silicon chips and assemble circuit boards, the people who do the actual work of production. Implicit here is the extreme segmentation of the Valley workforce into highly skilled technical and professional workers at the top, and the much more numerous production worker, often recent immigrants from Asia and Latin America for whom opportunities to advance are few. Indeed, the Silicon Valley is acknowledged by many to be a place of great racial and economic imbalance, referred to as the “digital divide.” Blacks and Latinos, the latter the fastest-growing segment of California’s population, are said to be missing out on the technology boom, as companies hire many fewer of these groups proportionately. Those who do find high tech jobs are far more likely than Whites to hold factory, service, and support jobs than managerial or professional ones (Angwin and Castaneda 1998). And in fact, the company I will describe in this article, Teamco,3 has been fined significantly by the US Department of Labor for such discriminatory hiring practices.

Teamco and its Self-directed Work Teams

I first learned about Teamco by reading trade journals—mostly articles describing its rapid success and its management strategies. Founded in the late 1970’s by an executive with management experience gleaned from another major computer company, it began as a small repair house for certain types of printers but moved quickly into circuit board assembly. Its primary work, then, is attaching electronic components to printed boards and thereby constructing the circuits which run the world’s computers, appliances, and even airplanes. Teamco’s sales increased twentyfold in ten years, and in 1994 the company reached a sales figure of well over a billion dollars; its stocks have in the last few years sky-rocketed. The company is now touted as one of the “hottest” manufacturers in the Silicon Valley, the recipient of scores of customer awards and national and international recognition.

Teamco is not just a manufacturer, however, but a “contract” manufacturer, performing services for other companies, services that were once carried out by those companies in-house. Since the 1980s, large corporations like Sun, IBM, and Hewlett-Packard have increasingly relied on contract manufacturers to do a substantial part of their work. Farming out certain parts of production, it is claimed, makes for a quicker turn-around time for products, and it is also cheaper to rely on contractors who can keep prices low by doing big volumes. The dark side of this development is that by relying on contractors, electronics companies no longer have to make commitments to a significant portion of their former workforce for job security or health plans or living wages (Siegel 1993). It is customary among those circuit board assembly plants in the Valley, including Teamco, to rely heavily on a temporary workforce. At the time I did my study in the mid 1990’s, wages were low—from six to ten dollars an hour—and lay-offs...
and enforced overtime, depending on the vagaries of customer demand, were the norm. No Silicon Valley factories were then unionized, and anti-union sentiment still looms large. (It is ironic indeed to juxtapose US advances in technology to the primitive state of its labor relations.)

Accounts of Teamco's success in the 1980's paid homage to its adherence to Japanese-style management strategies, and indeed, the company's president made several trips to Japan to study their techniques firsthand. Kaizen (continuous improvement), the Five S's (Japanese words beginning with "s" for orderliness, cleanliness, discipline, etc.—shades of Henry Ford!), poka-yoke (mistake-proofing the process)—you name the quality enhancement approach, and Teamco executives have been glad to try them. Three years before my study, Teamco began a self-improvement initiative which centered on organizing the factory around "self-directed work teams." The brainchild of a manager in charge of strategic development, this effort involved first, a series of seminars for mid- and upper managers, to introduce the necessity of a site-wide reorganization around teams and the reduction of management layers. The next step was to create a curriculum and training program for non-exempt or hourly workers, and to put three thousand workers through some thirty-eight hours of training. In conjunction with the training workers were divided into approximately two hundred teams which corresponded to their work areas. The newest phase of the project, implemented at the time of my study, was the linkage of compensation to team performance, determined by whether individual teams had been able to meet their productivity and quality goals for the quarter. There was also a system to reward individual teams, who competed against each other at company-wide forums and were judged on their presentations and their problem solving. My research allowed me and my research team to observe the training, to sit in on the meetings and competitions of a range of teams, and to follow the progress of these teams from their beginning through three quarters of work.

So, here is our drama: In the heart of the Silicon Valley, a prestigious company bent on continuously increasing its market share and its profit margin, decided that its multicultural, largely temporary, relatively low-paid workers should become team-players. These workers were directed, in addition to their assembly work, to begin to collaborate with each other on "self-directed work teams," to find ways to solve problems, to increase the company's productivity, and to improve the quality of their work. They were even expected to prepare presentations about their collaborative efforts, complete with overheads, data, and findings, that they would perform before management; they were expected as well to compete, team against team, for company bonuses. These frontline workers varied widely, not only in language and country of origin and time in the US, but also in education. While a few had advanced degrees, most had much less schooling, and a goodly number were not completely comfortable with English. Like Henry Ford's immigrants, these Teamco workers stood with one foot in the cultures of their home countries and their ethnic groups, and one foot in the epitome of the new work order—arguably the most dynamic, competitive, and quickly changing economic venue in the US and perhaps beyond.

How would these workers fare? What kinds of identities, in response to the subject positions defined by their company, would they be able to construct? And what lessons can we take from them about current and future attempts to "manufacture men?"

**Lessons Learned about Workers' Participation**

What I learned about workers' participation at Teamco is that employees did not just passively accept the roles they were handed. Rather, individuals actively constructed their personal goals, beliefs about themselves, and images of self out of the cultural models and socialization processes to which they were exposed. Despite the fact that, in their day-to-day work, people at Teamco were quite constrained by the social organization of work, they invented a hundred ways, big and small, to transform the definitions of self and worker that were being promoted and to shape or influence literacy requirements and work practices. They found ways to interpret the functions of teams and literate activities that diverged from the corporate notion. And they found ways to turn teams and literacy to their own purposes. Their choices were influenced by how they positioned themselves as individuals or groups in the situation and how their past experiences were connected to possible selves within the workplace context.

A few workers simply resisted the identity of self-directed work team member. Such was the case for Loi, a Vietnamese woman in her 50's, who had come to the United States five years earlier. During her first four years in California, she had worked in a nursing home in the Silicon Valley; then she landed a job at Teamco in the wave solder area, catching boards as they came out of the wave solder machine, inspecting them, putting them on trays and carrying the trays to the wash machine. The following excerpt comes from a section of a transcribed and translated interview between Loi and Craig, a member of my research team who was fluent in Vietnamese.

When Craig first asked Loi what she thought about self-directed work teams, she adopted the party line, claiming teams are good not only for the product, but for the company and "for everyone." Asked whether she saw any drawbacks in forming teams, she offered an account of other people's opinions:

Loi: The majority, most of the workers here don't like "SDWT" [Self-directed work teams].

C: But the majority of the people don't like this.

Loi: The majority, most of the workers here don't like "SDWT" [Self-directed work teams].

Craig: Don't like what?

Loi: The majority, most of the workers here don't like "SDWT" [Self-directed work teams].

Craig: But they don't like what?

Loi: They don't think it is something they should put any effort into. They don't like it. So they don't think it is something they should put any effort into.

C: That is, before, in Vietnam, this had already happened to people.

Loi: In Vietnam, because of fear of communists they ran over here.
Loi’s history beyond the plant was clearly part of her present notion of being a worker at Teamco. She attended the weekly meetings of her team, but was silent throughout them. When asked during meetings if she had anything to say, any opinions to add, her standard response was “I have no problem in my area.” And if by chance a meeting was canceled, she would smile broadly, clap and almost skip back to her work station, spreading the good news to her co-workers on the way. Unfortunately, Loi’s silence, as well as the silences of others in team meetings, was often taken by supervisors and team coordinators as a sign that she and her teammates had not grasped the concept of teams due to their lack of formal education.

While there were some instances in which workers seemed to buy into new roles in a big way, often expressing hopes of advancement in the workplace, the most frequent response to teamwork and the identity of self-directed worker was a measure of resistance simultaneous with compliance to the demands of work. One of the teams that I followed most closely consisted of a group of women from a hand-load line. This team, representing a low-prestige, and relatively low-skilled area of the factory, met weekly around a table in the company’s cafeteria rather than in the fancy and well-equipped training room. Their procedures for running a meeting were decidedly unconventional by the company’s standards. With much simultaneous speech and little in the way of order or apparent attention, this group perhaps epitomized the company’s (and the country’s) worries about an immigrant work force. Yet, they not only found ways to accomplish the work of teams, they also appropriated certain reporting requirements to their own advantage.

The young leader of this team, Xuan, had grown up in Vietnam and spoke Vietnamese as well as Cantonese, but lacked confidence in her English. Nonetheless, she took on many responsibilities regarding teams and their reporting requirements, and she became adept at the growing paperwork surrounding goal-setting. Eva, another member of the cafeteria group and a recent immigrant from the Philippines whose English was very good, became the informal spokesperson of the team, despite the fact that she was her most recent hire and still a temporary worker. In one of their team meetings, the group of women jointly constructed, with much over-lapping talk, an explanation for their low productivity on a particular day. They mentioned, for example, the fact that the board they were working on was foreign to them, it required them to load many components, and their line was short the requisite workers, to boot. And then, they went on to discuss how to document these extenuating circumstances so as not to be penalized on their productivity record and ultimately their team-based bonus. Here is a small bit of that conversation among me, Xuan, and Eva:

Eva: Then you have to make a note at the back and tell them the reason why is our productivity is so low that day. So they will give us credit for that = =
Xuan: = =I know, yeah, this time I forgot.
Eva: Ay-yai-yai! Oh:

Thus, temporary worker Eva chastised team leader Xuan for failing to document in writing the extenuating circumstances for the team’s failure to meet a productivity goal. “You will remember to do this if we don’t receive our bonus!” Eva teased somewhat sharply. And Xuan softly defended herself, pointing out that she usually kept such records.

Interestingly, I saw both women learn how to use literacy to their own and their team’s advantage through the creation of written records and through taking advantage of the authority that often attends putting something in writing. Circuit board assembly has become in recent years much more intertwined with textuality. Employees have to become adept at and comfortable around the paperwork that is part and parcel of everyone’s work now on the manufacturing floor; they must learn to conceptualize their work in terms of its written representations; they have to be able to master and manipulate the social and institutional rules that govern literate activities in the factory. Put another way, workers are asked to conceive of themselves, not just as employees who performed the physical act of placing components on a board, but also as thinkers, as people who monitored their own hand-loading rates, reflect on and analyze their problems, and report the same through print and through presentations.

Eva and Xuan did all of this, but they also engaged in what might be termed sub rosa literacy practices. Xuan, for example, began to keep a little black notebook of work-related information and strategies. Eva pushed at the company’s policies regarding temporary workers by writing a letter in which she complained that an oral promise to bypass her probationary period as a temporary worker had been broken—a letter that infuriated her supervisor, but had positive results for Eva. In the above transcript, we saw the women learning not only to fill out the innumerable forms, to track and report their quality and productivity each week, but also to document problems in ways that protected themselves. Thus, Eva and Xuan complied with team-related rules and fashioned themselves according to the company model for self-directed workers. But they also, albeit it different ways, found spaces in which to try out alternate models of working selves that were neither entirely resistant, as was the case for Loi, nor entirely compliant. And as one would expect, like many of the workers I came to know Eva and Xuan did not invest themselves entirely in their work; their working identities were
in fact a rather circumscribed part of their lives. During my research project Xuan was busily planning a traditional Chinese wedding and looking forward to life as a full-time wife and mother. Eva, already a parent, bided her time until she could leave the factory permanently and stay at home with her children.

Conclusion

This study contributes to a growing literature on personhood and illustrates how individuals respond variously to available models of self. It departs from the theoretical literature that sees virtually no possibility for agency—no chance of directing one’s own behavior or fashioning a self even partly of one’s choosing—and promotes a view of identity that focuses on continual enactment and potentiality. It also foregrounds those workers who are often absent in accounts of places like the Silicon Valley, workers whose responses to employers’ attempts to socialize them into particular types of workers is a fine reminder that not everyone is ready to march to the beat of the new work order.

Portraits of workers and professionals who are higher up in the information technology great chain of being do teach us, and helpfully so, the pleasures and challenges associated with an immersion in and identification with high tech work, including the interesting process of transforming it from work to mission (English-Lueck and Saveri, this issue). Portraits of high tech workers lower on the chain call useful attention to the “digital divide” and ever growing disparities, and they also help us question current conceptions of “enchanted” workplaces and views of what counts as good work and good workers. Currently, attempts abound all over the world to manufacture the same kinds of frontline workers by means of globalized work standards and a ubiquitous discourse of high performance work. To be sure, these new workplaces do require more of workers in terms of skills and know-how than did Henry Ford’s Taylorized automobile factories, and for this they are often praised. Yet I would suggest that our new work order is cut from the same cloth as Fordism in its attempts to impose particular working identities on immigrant workers or others considered similarly in need of socialization, and that it will likely meet the same measure of resistance as workers’ backgrounds, their current lives, or their images of future selves conflict with the available subject positions, rights, responsibilities, and material rewards offered through high tech work.

Notes

1. From 1915 to 1920 some 16,000 Ford workers completed a required course of study. Their graduation ceremony included a ritual that perfectly symbolized the transformation from immigrant to American: the men, dressed in their national garb, descended into a large pot stirred by teachers, then emerged dressed in American clothes and waving American flags. However, the programs were not to last. During the economic recession from 1920 to 21, the company faced serious financial crises and, among other cost-saving measures, officially terminated its Americanization efforts. Perhaps not surprisingly, there is evidence to suggest that the efforts were not succeeding anyway, despite the number of graduates. Some immigrants, for example, had no intention of staying in the US; on temporary sojourns for the purpose of making money and returning to their homelands, they understandably had little interest in adopting American habits and values (Schwartz 1971).

2. Part of the description of the Silicon Valley in Section III and the factory called “Teamco” in Section III come from Gee, Hull, & Lankshear (1996).

3. The names of the factory and its workers are pseudonyms.

4. Transcription conventions:

- (XX) - indicates number of indecipherable syllables
- , - end of phrase, but not phrase final notation
- . - final phrase downward intonation
- = - latched turns
- /talk/ - another speaker talks in the middle of someone else’s turn
- ... - omitted speech
- {non-verbal information}
- [other noise or talk]

5. A few workers were able to transform the company’s model of self-directed worker for the collective good. See Hull (2000).

6. It is instructive to compare the account of work offered here and in Gee, Hull, and Lankshear (1996) with the South African context described by Scholtz and Prinsloo (in press).

References


Missionary Zeal and High Tech Work on Florida's Space Coast

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Addressing National Needs for Skilled Technical Graduates, a research project undertaken by a collaborative research team at the University of South Florida (USF) and the Indian River Community College (IRCC) and funded by the National Science Foundation, was designed as a means to determine the skills that Associate of Science (A.S.) degree graduates must possess in order to adequately function in the workplace. This seemed a straightforward task. The investigation, however, led the team to examine a wide range of issues concerning high tech work and the place of the United States in the global marketplace. As we will clearly see in this article, the efforts of national policy makers, community college technical degree programs, and the workers trained in those programs for high tech careers work together in their mission to promote the social good through increased attention to both national and international industry trends and the skills needed to compete in the global economy. This attention by all stakeholders helps not only the industries but the community colleges and the workers as well.

**Background of the Project**

The overarching aim of the research was to determine the core of skills and knowledge, with a particular emphasis on SMET skills, (science, math, engineering, and technology) that all A.S. degree students must possess in order to function in the workplace. This common core of skills would then be used to improve the education sought by A.S. degree students at the community college, allowing for a more efficient and meaningful acquisition of workplace skills. Our study was undertaken as a sort of hybrid—it was both a study of high tech workplaces and workers and also a project undertaken to inform policy considerations. The location of the study was the Treasure Coast of Florida, an area on the central east coast of the state. Our sample included workers and supervisors in work sites from five industries chosen based upon job growth projections as locally and nationally: (1) computer programming and applications, (2) drafting and design, (3) electronics engineering technology, (4) radiography, and (5) respiratory care. Our research design combined the ethnographic methods of workplace observation and interviews with workers and supervisors at key sites on the Treasure Coast with structured surveys of the supervisors and the Experience Sampling Method (ESM), a new methodology that allows for immediate response to surveys at random times of day.

**Florida and High Tech Job Development**

The Treasure Coast's proximity to Cape Kennedy, with its boom and bust cycles of aerospace activity, has lent a high tech but erratic aura to the marketing of potential technical...