Episode 4: Community Memory and the Computing Counterculture...

Fri, 6/18 2:23AM • 30:54

**SUMMARY KEYWORDS**

computer, people, community, called, terminal, technology, free speech movement, lee, memory, student, bagels, mimeograph, designed, engineer, activity, tools, radical, campus, bulletin board, musicians

**SPEAKERS**

Lee Tusman, Lee Felsenstein, Mario Savio recording

**Lee Tusman**

You're listening to Artists and Hackers, the show dedicated to the community building new digital tools of creation. We talk with programmers, artists, poets, musicians, engineers and designers. We're looking at the current palette of art making tools online and take a critical eye to the history of technology and the internet. We're interested in where we've been, and speculative ideas on the future. Today's episode is supported by Purchase College. I'm Lee Tusman. In this episode, we're digging deep into the past of a radical history of personal computers. We're looking at community networks and the rise of people's technology. Our guest today is Lee Felsenstein, a computer engineer and a massive influence on the history of personal computing, and computing culture overall. I think the story of computers that's often told, is about the early birth and use by the military. And then much later about the rise of personal computers sold to the public by companies like Microsoft and Apple. And that's a story worth retelling and dissecting, but Lee Felsenstein's story is firmly rooted in campus activism in the 1960s. And it tells an alternative history of the rise of a people's technology built primarily for empowerment, and community and a prototype of the social internet to come. Lee was raised in a family of activists in Philadelphia, Pennsylvania, his parents took part in marches and rallies and they copied and distributed political flyers and brought Lee along when he went off to college to study at Berkeley. At that point, it was one of the most politically engaged campuses in the country, and embroiled in what was then called the Free Speech Movement.

**Lee Felsenstein**

In 1964, civil rights activity was had reached the Bay Area. We had to Freedom Summer, the

**Lee Tusman**

The Freedom Summer project started in June 1964, an attempt to register as many black voters as possible in Mississippi. A large numbers of student activists from around the country traveled to Mississippi to participate and experienced large resistance and violence from prejudiced communities and governments. They brought back their experiences to campus communities around the country, and their publicized work further encouraged more student activism.

**Lee Felsenstein**

Even before then, there was local civil rights activity going on regarding employment discrimination. And the Berkeley campus was a major provider of bodies for those activities. And this got noticed by the authorities, especially the Senator Knowland, who ran the Oakland political machine, and who had a newspaper, The Oakland Tribune, and apparently he applied pressure on the university to stop this nonsense with students being involved in off campus, sometimes illegal activity. The university complied and discovered a loophole, I guess, in their regulations and said you can no longer use this area of campus. It's not really public space outside those barriers. We never deeded it over to the city. So you can't collect funds. You can't raise. You can't advocate. It was basically "shut up and sit down." The students having gotten to this point, we're not going to put up with that and formed a coalition of groups called the Free Speech Movement.

**Lee Tusman**

The Free Speech Movement was an ongoing student protest against the leadership of UC Berkeley, who had been attempting to prevent students from speaking out publicly and organizing around political topics such as civil rights, anti Vietnam War protests and other activism. Mario Savio was a vocal leader of the movement.

**Mario Savio recording**

At the time when the operation of the machine becomes so odious it makes you so sick at heart. But you can't take part, you can't even possibly take part. And you've got to put your bodies upon the gears and upon the wheels, upon the levers, upon all the apparatus and you've got to make it stop. And you've got to indicate to the people who run it, to the people that own it, that unless you're free, the machine will be prevented from working at all.

**Lee Felsenstein**

And the Free Speech Movement was a really formative event for me and for many, many other people. I date the beginning of the counterculture to the Free Speech Movement, because a large number of students left the university and went off to establish what became the Haight Ashbury. Lots of other people made changes in their direction of study, a direction of life, and so forth.

**Lee Tusman**

Having been raised in a radical family Lee was part of the student movement as soon as he arrived on campus, and he was drawn to use his own family background as political activists, combined with his study of engineering.

**Lee Felsenstein**

So I was viewing my role in anything social as engineer, as somebody who knew a bit about technology and might be able to help in that regard. I had learned mimeograph technology, basically duplicator technology when I was 12 years old, at my mother's elbow.

**Lee Tusman**

Mimeograph and duplicators were early pre photocopy machines. Lee's parents were active in political organizing. And since this was way before the internet, this was the major source of getting the word out about events.

**Lee Felsenstein**

So I could do some stuff. And I decided, you know, I would hang around and try to find out what they wanted me to do, because everybody else I was dealing with was clearly very much more intelligent than I was and much more educated. And this led to an episode in which to be brief about it: they perceived an emergency. It wasn't really true, but they perceived an emergency and came running to me and say, quick, make me a police radio out of thin air, I suppose. And at that instant, I realized my strategy for waiting until somebody more intelligent than I told me what to do was a losing strategy. I had to be prepared and say, Well, you can't have that. But here's what you can have. And that meant that I had to go off on my own path. Technologically, and politically speaking, the combination of the two, I had to basically go out and explore and prepare in advance of being asked to do things. But then What was I supposed to do? I didn't know. And what I did know was that the Free Speech Movement mobilized the students into a community, and did that by making cross communications easy as possible. We had a phone room, and that became the prototype of not only the next few years, switchboards, which are these special interest, information referral places, such as would be a phone and a file card box, maybe a bulletin board, but also a prototype of the social internet. It became a place where people could call in to either ask questions or tell people that they'd had an idea, they wanted to do something. And where were there other people who could help? It became a place where people could be connected.

**Lee Tusman**

And so the switchboard operator would help connect different kinds of people together for these kinds of like organizing and political activities and questions?

**Lee Felsenstein**

Yeah, there were just two phones, there's wasn't really a physical switchboard. But there was a wall full of paper that would have been put up, and so a few people were able to encompass that mentally and know where things were. So I did manage to take a picture of it, which was forbidden, but I took it anyway. And it's got things like haircuts Central, you know, everyone wants to do a Central, which is a project or something they just made them up and call them in. And nobody would have thought to go out and say, we need somebody to give haircuts now. But somebody said, I can give haircuts. Here's my number, you know, send people to me. So I saw that model of non hierarchical communications through the phones, and a point of cross connection with the information being provided by the people who used it. That was the key, and I saw how well and effectively that worked. I went in search of appropriate media, and technology for this media. I joined the underground press. While I was still in school, I started helping out at the Barb and it was just in its first year of publication. And I saw how that morphed from a very small like eight page tabloid where I would go to a given pizza parlor and wait for my connection, who would come in and selling the paper went from that to a circulation of 100,000 and full of sex ads and so forth. And I realized that this was not the kind of media I was actually hoping to develop. And so I kept working at it and kept thinking about it, I began to research the switchboards and discovered they had something other in mind than than what they purported to be concerned with. The switchboard activity was a means to that end. In that process, eventually I dropped out of school, I went into depression, second, couldn't be a student successfully. But I could hold down a job and began working as a junior engineer learning about the technology, some more. I already knew quite a bit, but not really that much. And they sent me to a place to learn how to use the BASIC computer language, that was the one you could use almost like typing English.

**Lee Tusman**

In this early computer era, Lee would have been typing into a device called a terminal, which was just a screen and a keyboard, no processor, or hard drive or memory, for example, dozens or hundreds of these terminals could all be connected to the same machine, by a wire through a phone line in your city or another. These machines were giant room size computers called mainframes.

**Lee Felsenstein**

At that time. 1970. There were no personal computers. Their computers were mainframes. The place I was learning this at was called a Service Bureau. They didn't have a computer there. So a light went on in my head there. This is not geographically central. It's everywhere, and yet nowhere. And then I was told how you could give a file accessibility to different levels of your usership by prepending the file name with certain number of asterisks. Three asterisks. Everybody on the system could read it. One asterisk, only one or a little group that you specify. And I realize this is a possible tool for creating intentional community, communities of interest. And a light went off and I realized, what I'm looking for is a network of computers. And then I straightened up I said, but where am I going to get a computer? In a year, I'd had the answer to that. I was sent to a group who had been working to secure a computer, a real computer, a time sharing mainframe computer, and I signed up with them and became their hardware engineer to help them set it up. I went to actually live and work in the same building as that computer. So this was the Resource One computer and this was intended to provide computer capability to the counterculture but how they were going to do it they didn't really know.

**Lee Tusman**

Resource One was part of Project One, the first inhabited DIY warehouse community in San Francisco. It was a non hierarchical collective, organized through weekly meetings of its members made up of artists and craftspeople and filmmakers and musicians and architects and activists and technologists. The building was formerly an abandoned candy factory. It soon housed a large number of collectives and small nonprofits. It had a radical daycare, a childcare community switchboard, a community radio, a community dark room, music studios and ecology center, drug rehab and alternative high school. And on the ground floor was Resource One, a people's computers center, which was completely unheard of at that time.

**Lee Felsenstein**

I came in with this idea, this network to create cross connections between people, together with some other people I brought in. That became Community Memory. So that was set up in 1973. August, I think, 8th, 1973. We set up a terminal at the student run record store in Berkeley. The student council, the student government had undertaken to start a record store in order to drive record prices down. This was successful. So we went and presented our case to the student council and they said great, go ahead and do it. So we set up a teletype and mechanical teleprinter and hooked up to a phone line, which called our computer once a day. And stayed on the line. It was a local call. So we were the first of many modem users there. And it was a bulletin board.

**Lee Tusman**

A digital bulletin board we can think of as a computer on a network that allows multiple people to log in and post messages and announcements. Maybe a more recent example of something that's like this is Craigslist, but you only have a small idea because that was started by a company and these digital bulletin board were really community projects. They had their heyday in the 80s and early 90s, before the World Wide Web really took off with web browsers. But prior to that Community Memory was really the first public bulletin board, a computer terminal that you could visit when you went to your record shop, which of course, was a mandatory activity in the era before streaming, particularly if you wanted to get new music each week. Other times people would go just to check out the flyers on the wall. And in fact, the first Community Memory was set up right next to a wall of flyers, which is how people found each other before the World Wide Web.

**Lee Felsenstein**

The software was structured fortunately so that it was not limited to the categories that we had specified. We thought that there would be only like three categories: jobs, housing and cars, that was set up in front of a musicians bulletin board in the lobby of a record store. And apparently, all of that musician traffic came over to the computer. Better technology. So we had a large Music and Musicians section. They could specify what the category was. I guess you could create a category out of thin air, it could be anything.

**Lee Tusman**

Are there any categories that stick in your mind that were particularly kind of unique or funny or interesting that you hadn't conceived of?

**Lee Felsenstein**

We seeded it with an item saying, Where can you find good bagels in the Bay Area? Now in 1973 bagels were pretty rare in San Francisco. And we got the expected answers to them, directed the reader to stores that sold bagels and the third was the kicker. It said if you call such and such a number and asked for such and such an ex-bagel maker will teach you how to make bagels. And this was exactly what Ilitch was advocating in that book, the learning exchange. In 1970 a guy named Ivan Ilitch, a Catholic philosopher who had left the Jesuits and written a book called Deschooling society, a very radical, heretical book saying we don't need education as an institution, people can teach each other things. And that's how they do it. in the developing world, because he had studied that

**Lee Tusman**

This radical model proposed by Ilitch inspired Felsenstein to come up with this space where connections could flourish, and even new art movements could be possible.

**Lee Felsenstein**

Now, there are others where people would do typewriter graphics. There was a poet who was advertising his wares. And he would write a little poetry and then say, for more poetry, call this number and ask for name. He continued to advertise on it. I made connection with somebody who I didn't remember really from my co op, Bob Marsh was his name, he had started, no, he was not starting a company at that point. He had worked as an electronic engineer. And he basically wanted to talk me into sharing a workshop with him, and helping him figure out what he wanted to do next. And then 1974, he'd made that contact through Community Memory. That became Processor Technology. And that was the company that produced the stuff I designed much of the stuff I designed. Community memory had a problem: it needed terminals, it needed electronic terminals that weren't too expensive. And could be repaired, especially since they would be in public use. We tried renting a terminal with a service contract. And I discovered the service technician didn't know what he was doing. They were very expensive. And I think they cost like $1500 in 1974 money, which was a lot more I mean, there's been a factor of inflation of somewhere around five or six since then. So you, you couldn't just run out and buy one with your spare change. They used cathode ray tubes, which is TV tubes, which used to be, you know, large and bulky. In 1973 somebody published a do it yourself article of how to build your own quote terminal. He called it the TV typewriter. And that grabbed a lot of people in what would become the personal computer community but wasn't yet. It allowed you to use your own TV with a keyboard that you had to build to put text up on the screen and they said, Well, you could also use it as a terminal. It turns out you couldn't the way it was architected. So I called up the guy, Don Lancaster and asked why he did it that way. He said "people just want to put up text on their screen. I don't know how to make it work as a terminal." So I began to explore that at the time I was hanging out with the some people in this little tiny personal computer underground. At the time, we had our own little underground newspaper, and go into potlucks. And from those discussions, I worked out what would be needed. My concept was from a village and was expressed that in order to survive in public operation, a piece of computer technology had to grow a computer club around itself. So the challenge began or became to design such a device, such technology, and I realized that I would design it for that little personal computer underground community, people who wanted to get their hands on it, and I would design it so that it could be expanded. It would start out as an unintelligent terminal. No microprocessor. Microprocessors had just come into existence at that point. But they were tremendously expensive. And I didn't think they would really make it into a public use. So I designed something that would do it by itself. And I designed something that was centered around memory, not the processor, the central processing unit meant central. Well, the memory is central. That's my architectural innovation there. And I made, designed it to be expandable, but I did the design work for how the terminal would work. And I wrote that up as an engineering specification, and I use my own mimeograph to publish it, sold it for 25 cents among this underground. So I did publish it in 1974. I called it the Tom swift terminal in honor, as I said, of the fictional character most likely to be found tampering with the equipment. So this was a piece of equipment, a terminal, which is a future computer, which was intended to be tampered with, and to attract people who would see this as a resource and protect it and repair it, and so forth. So as a self repairing computer,

**Lee Tusman**

Actually, the concept of a self repairing computer today is just as radical an idea, particularly in a day and age of things like end user license agreements on the software and hardware that we buy that restrict how and what we can do with our own computers.

**Lee Felsenstein**

Computer Technology in that time was under the thumb of what I call the computer priesthood. And these were the engineers and managers and so forth who like to rely on the computer for their own self importance. In the 1970s computing was seen as the domain of experts and computer professionals. And they guarded their knowledge of the technology fairly jealously. The only way you could really learn the stuff was in the university, especially in the hacking community, which is very small and very tightly focused on learning things. And writing software for each other to use and so forth. There was no internet, there was a primitive internet called the ARPANET, but you had to be within a certain military industrial establishment in order to have access to that. So the whole idea of people messing around with computers, getting your hands on it, tampering with the equipment was anathema to them, you'll break it. And they had a lot invested in all of that being the geniuses who knew how to keep the equipment from breaking. Okay, so we basically we were out to break that whole worldview.

**Lee Tusman**

At that time, the whole earth catalog was popular amongst the counterculture, a catalog filled with articles and listings for tools on self sufficiency and do it yourself culture, ecology and alternative education. Its motto was access to tools.

**Lee Felsenstein**

I made up a little motto, if work is to become play, then tools must become toys. And that was what we were doing. And community memory was very important and very serious. It was my whole focus of my existence. So it was work, it was serious, but in order to make it go, it had to be a toy. So this set down some some challenges for me as a designer.

From Lee's original work on the Tom swift terminal. He continued working for Bob Marsh and designed the Sol-20 next. This was the first fully home assembled microcomputer and it came with a built in keyboard. This was before the era of modern monitors so you could actually connect it to a television for output. It was really the first home computer and it could also connect to a cassette deck, which is how you could write programs to memory back then storing data instead of music. These computers were sold assembled in kit form or as a free collection of plans to those who wanted to source their own parts and build it themselves. Several years later, based on this now fully accepted architecture, Lee designed the Osborne-1 computer, the first commercially successful portable computer, a very early predecessor to the laptops of today. It weighed 25 pounds. So this was a huge improvement on the room size computers from a decade earlier. And while Lee moved on from working on Community Memory, it continued to exist in various forms for the next 20 years. In fact, I'd like to think of Community Memory's spirit as re-inspiring a new generation of engineers, artists, programmers, and DIYers today, to forge new tools for community and connection.

**Lee Felsenstein**

I like to say about community memory that we opened the door to cyberspace, and showed that it was hospitable territory, mainly because of the data, the content as they say now, was embodied in the usership. All that came from them, and went back to them. And that's a really major characteristic.

**Lee Tusman**

I think that's really beautiful. And one thing I'm also thinking about, however, is that over the past 40 years, this kind of technology has become ubiquitous. But it's also been co-opted, and has kind of taken a bunch of different turns through Silicon Valley as well. I'm wondering if there are areas that you see that are, that are hopeful in today's computing environment.

**Lee Felsenstein**

I'm very hopeful about the computing environment today, because the technology is no longer a secret. It's not easy to learn. But it can be learned, and it's expected that people will learn it. When I inquired of the guy who designed the last Community Memory system in 1992, how long it would take to redo that work to rewrite it. He said about two weeks, which is amazing, it took easily six months back then. That's because everybody's standing on everybody else's shoulders with a lot of tools and libraries and work done that can be just pulled off the shelf for free and used. This is a really major improvement. It means that the business establishment is not in charge anymore. They make use of it, but they can't really control it. They had to give up control. Now, that doesn't mean that it's under enlightened control. At this point, it's just out there for everybody to use. My hope and my focus is to try to enable people to use it as if it were play. Google and Facebook and so forth are using it to rake in money by the billions. Okay, that was always going to happen. But the people in those companies could walk out the door and do it again elsewhere. They don't require all that money. And that's a very, very significant factor. We have basically decoupled the development of computer technology for human use from the financial structure. Now, obviously, it's not going to do everything all by itself. You don't have to just kick back and let it wash over you, you have to participate. And life's a bit like that, you know. I think our prospects as a civilization are much improved as regards Information Technology, computer technology, or whatever. Because this whole path of hacking, of hands on use and reinvention of technology has happened and is continuing to happen. You know, I'm exploring the idea of mesh networking and how to make that work in accordance with some of the concepts that I developed in, through Community Memory, you know, public space, and what happens in public space. It's all open, open for such experimentation. I can imagine scenarios in which it's easier to work with, but that's always the case. It's not the end, you have to do the work.

Lee, thank you so much for speaking with me. That's our show today. You've been listening to artists and hackers. Our guest today was Lee Felsenstein. I'm your host Lee Tusman. Our audio producer is Max Ludlow. Coordination and web design by Caleb Stone. You can find out more about what Lee is up to, including his work on mesh networking based on ideas from Community Memory on his Patreon page at patreon.com/lfelsenstein. We have a link on our episode page on our website. Our music today is Ketsa, Funky Garden and Noel Griffin's The Machine Mensch. Our recording of Mario Savio is from Human Rights Foundation. You can find more episodes on our website, artistsandhackers.org. You can find us on Instagram at artistsandhackers. And we're on twitter at artistshacking. If you like the show please let a friend know and you can write to us at hello@artistsandhackers.org. Thanks for listening.