

A Whole New Worldview

*Anthropologist Christopher Kelty on programmers, networks
and information technology*

Christopher Kelty is an ass. professor in the Department of Anthropology at Rice University. Dr. Kelty has studied telemedicine professionals and the political economy of information in healthcare; the Free Software and Open Source movements; cultural aspects of intellectual property law; reputation, trust and exchange in communities of software programmers; and the history of medicine in America. In addition Dr. Kelty teaches classes in science and technology studies, the mechanization of thought processes, ethnographic fieldwork methods and the history of memory systems and universal language schemes. He is a frequent participant in events related to copyright, free software, open source and open content of all kinds.

UBIQUITY: Our mission today is to find out how an anthropologist thinks about information, networks, and information technology. What kind of anthropology do you do? How do you claim to be an anthropologist?

KELTY: The reason I'm an anthropologist largely has to do with the fact that I do qualitative fieldwork. Though I was trained at MIT in the History and Social Study of science, technology and society. I teach in a sub-field of anthropology known as social and cultural anthropology.

UBIQUITY: In your fieldwork, where do you study people?

KELTY: Because people move about a lot more, and because people are connected in ways that they weren't 100 years ago, anthropology has had to change as well. It's no longer easy to pick a field site based on an isolated people or a particular place. The people that we study move around much too often. When I study scientists or engineers, for instance, it requires traveling to conferences or meetings, as well as hanging out in labs or offices.

UBIQUITY: Let's say that you want to make a generalization about hackers. How do you encircle their domain?

KELTY: Traditionally, anthropologists have distinguished between emic and etic explanations. Etic is the explanation that anthropologists give of a particular set of people. Emic is the explanation that a set of people gives of their own society and activities. These days it's easier to start with the emic explanation because many different groups of people already describe themselves, their "worldview" and their social structure in fairly explicit and detailed ways. When I study hackers, for instance, it's easier to find people who self-identify as "hackers"-- there is even a definition: "you are a hacker when another hacker calls you a hacker (hackers love recursion) -- than it is to say a hacker is "X" and then try to find people who fit that definition.

UBIQUITY: What are the advantages/disadvantages of identifying people in this way?

KELTY: The advantages are that I can find them easily and I can let them do a lot of the explaining that I would otherwise do by myself. The disadvantage is that I miss people who may not identify that way, but may be engaged in the same social world. Not all people involved with "hacking" are self-identified hackers.

UBIQUITY: How do you go about finding those people who don't self-identity?

KELTY: I start with the emic explanation. I look at what the people do and at who they interact with. I generalize from there with the final goal being to find what ties people together in a given social world. I don't just follow hackers. I also follow entrepreneurs. I follow people who might be called visionaries. I follow activists and lawyers. All of these people are engaged in some of the same social worlds as hackers but they may not call themselves hackers. In the end, the goal is not to study a particular people, but to investigate the nature of social relations and shared attitudes towards the worlds we live in.

UBIQUITY: You teach an introduction to information and networks. How do you go about doing that?

KELTY: I take a broad notion of information and networks and try to shock the students out of thinking that information and networks are only technical things.

UBIQUITY: How do you shock them?

KELTY: A couple of ways. One is by the social psychologist Stanley Milgram, (originator of "Six Degrees of Separation") whose small world experiment explains how people can create networks with the postal system by sending postcards from person to person. Stanley Milgram demonstrated that we're all connected by approximately six degrees. Those connections are random enough that you can get from point a to point z without having to go through all the letters in between.

UBIQUITY: Even to Kevin Bacon?

KELTY: Most importantly to Kevin Bacon. He is a special kind of character in small world studies. He is one of those central nodes that many people go through in connecting to other people. Milgram speculated about this ... that there were important people in the networks. In fact, in his original experiment, a large number of the original responses went to a single person who was an important person in the community where the postcard was supposed to go. In anthropology, these kinds of people are very important, because they often know everyone, and have a broad sense of why people are connected in the ways they are.

UBIQUITY: How else do you shake out their beliefs?

KELTY: I also start with a work on the bazaar economy by anthropologist Clifford Geertz to try to get the students to think about how information is not necessarily something that circulates on the Internet. It is something that can be understood socially as existing in a particular time and place through repeated interactions between people. Geertz describes how when people shop in a North African souk they go back repeatedly to the same person because they've developed a relationship with the seller. He calls that clientalization. That's an example of how to think about information without having to think of it as a technical thing. I also talk about the differences between communication networks and social networks and try to give the students a way of thinking about how one might have both a communication network and a social network at the same time.

UBIQUITY: Do you find that students swim easily in areas like this? Or are there problems?

KELTY: It's quite hard for students to get their head around. Undergraduate students especially are dominated by a conception of the world in which information and networks require a technical mediation or a machine. It's also hard for them to think about human relationships in the same terms that we think about communication technology. I ask them to do that, not because I think all human relationships can be described in terms of communication technology, but because I think that there are a lot of metaphorical descriptions going in both directions. We describe human relationships using technical terms. We also describe our technical systems using metaphors and images from our human social world. I try to get them to think in both directions, from the technical to the social and from the social to the technical, with the assumption that they'll realize that descriptions of either technology or society are not set in stone.

UBIQUITY: I'm still stuck on the idea that there are some things that don't require machines.

KELTY: We joke about it, but I do have to answer the question every semester, "What did people do before e-mail?"

UBIQUITY: What is your answer?

KELTY: I don't have a good answer yet. I haven't figured out a technique for giving people enlightenment as to how we got along without the Internet for so many years. I've contemplated making them do all of their work without sending e-mails for part of the semester or perhaps reintroducing them to the postal system. It all seems so cruel though.

UBIQUITY: Had they ever heard of a card catalogue?

KELTY: Some of them have. But usually it's a mystical thing that they think is from a previous civilization. In some ways that's where I get to flex my archeological interests.

UBIQUITY: Are your students mainly technical students?

KELTY: I do get mostly technical students. Somewhat that's a feature of Rice University because Rice is heavily focused on science and engineering.

UBIQUITY: Do you have trouble getting these technical students interested in the social sciences?

KELTY: There is a lot of work to be done in teaching science and engineering students. They are obviously very bright students. They're incredibly at ease with the technical side of things and have no qualms about diving into a project or a problem that involves anything technical. But there is a lot of work in teaching them to combine that interest with work in the social sciences and humanities. The students are not at fault here. To some extent, the humanities and social sciences have backed away from the responsibility of teaching in the context of science and technology.

UBIQUITY: Why did they back away?

KELTY: Part of it is the self-fulfilling prophecy of the two cultures. Once people started to talk about them as two cultures, it became more legitimate to keep them apart. The other thing I encounter is the attitude (from the engineering and science schools) that humanities and social science scholars are there to humanize technology or to somehow enlighten us as to the social issues or social causes of technology. In some ways I think that's the duty of scientists and engineers just as much as it is of humanists and social scientists. This division of labor where scientists and engineers do the science and humanists and social scientists just talk about its social impact or its history is an unfortunate division. It's one that I try to teach undergraduates in engineering or sciences to overcome. I try to make them think about what it is that they do in their science and engineering classes as if history and the social world matter to it.

UBIQUITY: Do your students have a certain amount of impatience to get beyond this historical stuff?

KELTY: They do have a certain amount of impatience, but it's not to get beyond historical stuff. It's to find utility in what they're doing.

UBIQUITY: How do you counter the impatience about utility?

KELTY: The most obvious places where I can counter that impatience is to talk about intellectual property and other legal issues, ethics, or how to be a civic engineer or a civic scientist. Students see these things as being relevant to what they do. It's tricky because it's very difficult to walk the line between being subordinated to the demands of an engineering degree and making the case that this is central to their education. It's hard to find that little corner of their time and convince them that it's worth their while to spend time thinking about history or society or culture.

UBIQUITY: Do you generally feel that you succeed or fail?

KELTY: I succeed more often than I fail, which I'm very happy about. Teaching is a funny thing. If the students absolutely don't have any interest, then there's no way you're going to win them over. But for anybody who shows a little spark of interest, I can find ways to make them excited about pursuing their interests. Usually those who most desire "utility" are the same ones who are least interested in being there in the first place.

UBIQUITY: Let's continue with a 20,000-foot-above-view of your introduction course. What comes next?

KELTY: There's a long focus on contemporary questions. In particular, I tend to focus on things that appear to the students at the outset as very banal, boring issues. That is, standards, protocols and intellectual property rules. The reason I teach these relatively arcane things is because I take endless delight, I never tire in showing how supposedly arcane technical problems actually turn out to be political or to have been very political in the past.

UBIQUITY: For example?

KELTY: In the case of standards, I like to use the example of how the TCP/IP Internet protocols found themselves opposed to a more academic standard known as the OSI standard. In the 1980s, there was a kind religious war over the OSI (open systems interconnection) and the TCP/IP standard. The TCP/IP standards were developed from the bottom up, as it were. Engineers were constantly revising them. Whereas the OSI standard was done in a very focused technical committee manner. It was probably a more robust and complete standard but it was also much harder to implement. TCP/IP was actually implemented in various operating systems (notably UNIX), making it easier to muck around with.

UBIQUITY: What is the lesson to be learned here?

KELTY: I use this as an example of how the institutional or social setting for something can determine whether or not standards get adopted, and how the political organization of a standards body can be related to its technical character. Even though OSI was probably a better standard by some academic markers, TCP/IP was easier to implement and use in a common sense way. It is not enough for engineers to think that if they write a really good standard people will adopt it. They should also think about the social settings, historical circumstances or different contexts that might affect what it is they're trying to engineer. It's also a way of suggesting that the difference between good and bad software is not always so obvious.

UBIQUITY: What issues do you cover under intellectual property?

KELTY: In terms of intellectual property, there is no shortage of things to study. That's become an extraordinarily lively field as of late. What I generally do is give a legal overview. I find that there's a lot of misapprehension about what copyright law or patents law actually do. In the case of copyright law, for instance, there are misapprehensions about the way in which fair use works, and about the risk that people may or may not incur by using copyrighted material. The way I usually put this is to say that intellectual property rights hand a kind of police power over to private bodies.

UBIQUITY: What kind of police power?

KELTY: It lets people make decisions about who can and can't use copyrighted or patented material. The way I get students interested in this lately is through the explosion in Free Software and Open Source. Students are usually surprised to find out that's fundamentally an intellectual property innovation. The reason free software exists is largely because it was licensed under a particular kind of copyright license. Some of them know that (because I often get students who are hackers in my classes) but most of them don't. It's enlightening for them to understand that Open Source and Free Software is a phenomena that they've probably seen or come into contact with but don't understand why it exists or how it works.

UBIQUITY: Is an exam question at the end of the course, "Is Microsoft Word a good example of free software?"

KELTY: That would be a good question. I usually try not to mess with the students too much. I try to make them think carefully about their own practices. I often talk about the kinds of software they use and what the intellectual property issues might be. It's one thing for people to think about their own private use of Microsoft Word as having an impact on either their own practice or on the income of Microsoft but it's much harder for them to understand the way in which this might also be a social issue. A better question might be "What would be the impact of making Microsoft Word Free Software?"

UBIQUITY: As students grapple with these questions, do they remember that they are asking and answering anthropological questions?

KELTY: Yes. I try to make them return to that constantly. When you talk about intellectual property, or the software industry, you are more or less forced to confront a fairly dominant economic worldview. Anthropology occasionally adopts some of the same ways of thinking about the world that economics does, but not always. It's important to clarify that, for instance, the economic justification for the existence of intellectual property is different from the actual uses to which people put intellectual property. That is a way of making them think anthropologically. Rather than taking as given the explanations that economists or lawyers give, they are charged with finding their own explanations, and with actually examining real world practices, rather than only the theories..

UBIQUITY: What are your research interests?

KELTY: My research interests are similar to the topics that I've discussed as far as the intro to information and networks class. Early on, I got interested in thinking about a problem in telemedicine. I worked with an architect in Boston who was interested in building an operating room that incorporated telemedicine into it. I started asking around about telemedicine and discovered that there were telemedicine programs at the big hospitals there -- Massachusetts General and Brigham and Women's Hospital. I was interested in how healthcare professionals might think about what would change when they decided to deliver care or do diagnoses at a distance.

UBIQUITY: What did you find?

KELTY: I discovered fairly quickly that there was an awful lot of excitement and enthusiasm about it, but very few real projects underway -- but it turns out that even such "hype" is an interesting topic for anthropologists, since it involves belief structures of some kind. In the course of doing this, I met a few people who were part of a very small startup -- about five people when I met them -- who had focused on a particular aspect of telemedicine, namely archiving and communicating high resolution medical images, x-rays, cat scans and MRIs.

UBIQUITY: When was this?

KELTY: It was in 1996. They were building a system based on Internet and Web standards written in Java that would allow them to move images around on PCs. Prior to this, it had been basically a mainframe world. The big imaging companies like Agfa or Siemens would build huge turnkey systems to manage medical images in a particular hospital.

UBIQUITY: This small group had a different approach?

KELTY: Yes. This group thought they could build a small, cheap system based on Web standards that would allow the images to be brought up on a viewer on a clinician's or a radiologists desktop instead of having to buy big image viewers and

mainframes to manage it all. Over the course of a year and a half, I spent a great deal of time with this small startup and also with another, larger telemedicine initiative in a different administrative wing of the same hospital that was concerned with doing clinical trials on the effectiveness of telemedicine.

UBIQUITY: Did the two groups approach their research differently?

KELTY: Both of these places, even though they were focused on slightly different issues, had to deal with the same thing and that was how technical standards would be incorporated into their vision of their goal. The small startup, for instance, looked at the Internet and the Web and saw a real innovation and a great way of organizing a network. They wanted the Internet (and its standards, such as those of the IETF) to be at the center of how they managed medical images. At the same time, the clinical group and their engineers said that IEEE, ISO and other national standards were the way to organize the technology. The difference turned out to be quite important. I thought that by looking at the attitude that these two different groups had towards something as technical and mundane as the standards and the way in which they're made legitimate would have important consequences.

UBIQUITY: What were the consequences?

KELTY: The most important consequence was that the small startup succeeded in what they were doing and became a 500-person company. The clinical telemedicine group stayed the same size and continued to struggle and eventually disappeared.

UBIQUITY: Did the small group succeed because it chose the right standards?

KELTY: I don't necessarily make any claim that that's because of the standards. It had more to do with the way in which the people who were in either of these groups understood their own roles with respect to the institution and what they wanted to accomplish. And that, in some ways, is the anthropological center. Scientists and engineers like to think that the technical and scientific issues can be separated out from the social, sort of fuzzy issues. My claim is that they're heavily imbricated or tied together. I often like to say that the successful people I study are

better anthropologists than I am -- they have effective "emic" understandings of the world they live in.

UBIQUITY: What other fieldwork have you done?

KELTY: Subsequent to that, I became interested in Open Source and free software. I spent time in different cities -- Berlin, Bangalore, Bombay and some in Boston -- looking at people who were involved with Open Source software or free software and asking questions about why they were involved and what they were doing. This allowed me to do a comparative study between different places.

UBIQUITY: What was your most interesting comparative finding?

KELTY: The most interesting comparative finding is that, for instance, in Berlin as opposed to either the US or Bangalore, free software and Open Source is an intensely political and intensely civic pursuit. It is often tied up with politics surrounding not just intellectual property but also freedom of information, freedom of speech, various kinds of activists' interests, sometimes even Marxist groups or social movements. That was not true in India or the US to nearly the same extent. In both of those places, the primary participants in Open Source software circles were people who saw themselves more as entrepreneurs than as activists. They saw themselves as potentially being able to take the technology of Open Source and creating a profitable business.

UBIQUITY: Have there been any great surprises to you in your work?

KELTY: Yes, there have been a couple of great surprises. The point at which I realized that Open Source, in particular the GNU/Linux operating system, and free software had a political component and weren't just a hobbyist's activity was an enlightenment. It led to a way of asking old questions from anthropology -- questions about social movements, political organization and political identity, and the relationship between society and technology. In some ways this is not enlightening to the Open Source hacker or to the engineer who deals with Open Source software. It is more obvious to those people because they're deep inside that world. But for people who study sociology, anthropology or history it is kind of a

shock when I explain how this phenomena has developed over the last 20 years and exactly what it means to the people who are engaged in it.

UBIQUITY: That relates back to the question of how do you get inside that world in order to make observations?

KELTY: Yes, in a simplistic sense, anthropologists who went off to Samoa studied the Samoans and asked questions about them and came up with theories about them and then came home and reported to anthropologists. That's an easy model to follow. I could go off, as it were, study the hackers and then come back and report to the anthropologists and say, "Look at this strange tribe. Aren't they odd?" But as it turns out, I am caught between these two worlds. The people that I study provide very interesting and compelling explanations of their own behavior, (those so-called emic explanations) that I want to either critique or contribute to. Sometimes I think there's something wrong with them and I would rather provide a better explanation. Sometimes I agree with them and want to contribute. Often the way in which that explanation occurs, say, amongst hackers is something that anthropologists have a very difficult time understanding because it's in a different language, a different idiom, as it were. It takes a lot of translation work to make anthropologists see why this is so interesting to the people themselves and to me. I get stuck in the middle wondering where home is. When am I going to arrive home so that I can report back to my people?

UBIQUITY: Would a company such as IBM or Oracle have an interest in letting you lose in the company and seeing what you came up with?

KELTY: There is in fact a significant tradition of anthropologists working in the computer industry. One of the places that had the most success with this is Xerox PARC in Palo Alto where a group of anthropologists under Lucy Suchman worked on various aspects of technologies and how humans interacted with them. Some famous studies came out of that regarding how the user interface of the Xerox copier works or how copier technicians, for instance, communicate with each other. There are many different places that an anthropologist could go in various corporations in the high tech world to do this kind of work.

UBIQUITY: Is there any possible future project that you would want to do if there were a way to do it?

KELTY: I think there's a tremendous amount to be said about styles or aesthetics of computer programming. For me the touchpoint or origin of thinking about this is Donald Knuth. His attitude towards computer programming is that it is in fact a "worldview" and a poetic one at that. Within that worldview, there are different ways of relating to algorithms, machines, networks and software. It's become clear to me that if you move from, say, hackers who've taught themselves everything they know, to people who were trained in a computer science program, you get a very different vision of how the world of technical things works and why!. It would be an absolutely fascinating project to look in detail at what the important differences are and how those differences are related to historical, institutional, national and cultural contexts. It's too easy to say that computer programming is computer programming. Like natural languages, computer programming tools are only getting more diverse, and they are only getting more complex. I think there is much more to be said about thinking like a programmer.

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