

Lessig shows how infrastructure can be a manifestation of the implicit values of the power structure in society. What earlier readings reflect this definition? In other words, think about what readings other than the specific unit on *Values and Ethics* bear on the question of how societal values get embedded in the tools and processes of everyday life. Tie as appropriate to those week 14 readings. (1000 words maximum)

Larry Lessig describes four ways in which implicit values can be incorporated into infrastructure: laws and policies, social norms, market structures, and architecture [1]. What we value as a society, as organizations, and as cultures are woven into the routines and processes by which we organize our lives. Earlier readings from the course support and highlight each of these ways in which we encode our values.

Laws and policies

Olson describes limitations imposed by law and ethical boundaries in neurological research [2]. The BIRN project, in forming a collaborative to construct a database of brain images, faces a “complexity of jurisdictional issues” in compiling a centralized database for use by the larger research community. Since the original data were collected under varying Institutional Review Board arrangements, it is unclear which images are available under different institutional guidelines. Law and IRB policies, in this case, encode a broad range of ethical views on the use of human biological data for research purposes. The variation in institutions’ strictness (or lack) in the collection of biological information, an extension of society’s views on ethical boundaries regarding definitions of humane treatment and the sanctity of the body, is embedded in the policies governing the everyday life of scholarly and applied medical research.

At times, the values held by society can affect political and legal mechanisms in destructive ways. Bowker and Star discuss the early identification of a cluster of rare diseases affecting gay men in San Francisco in the early 1980s [3]. Political powers mandated that certain Census Bureau data was not compiled into a centralized database for analysis of this trend. Several histories of the AIDS epidemic lay blame on the negative cultural biases against homosexuals as determinants in the reluctance of the government to pass laws regulating the screening and use of blood products [4]. The accounts point to a disdain for the gay population becoming embedded in the actions, sanctions, and infrastructure for response to what would become a national health epidemic.

Social norms

Implicit values based on gender, according to Edwards, generate social norms that drive girls and women away from mathematics and computer science education [5]. He argues that cultural views subtly create systematic oppression within the educational infrastructure, citing incidents of boys harassing and demeaning girls in order to exclude them from computer classes. At the college level, computer science curricula are constructed to emphasize activities that have been found to be difficult or uninteresting to women. The effect is lower rates of women in computer science programs and in high-level positions as computer scientists. The lack of female role models in the computer science industry cycles to maintain the infrastructural “patriarchy” of the field.

In a more positive light, social norms which value experience in performing or enacting tasks are embedded in the master/journeyman/apprentice models described by Lave [6]. The example of the enculturation of newcomers to Alcoholics Anonymous emphasizes the transmission of dominant culture's value of sobriety. By observing more experienced "old timers" construct stories of implementing the famous "12 steps" (which describes an infrastructure of Christian cultural values in itself), newcomers learn to construct and reframe their own experiences in sobriety through legitimate peripheral participation by enrolling in a community of practice. As noted by Lave and Wenger, the apprenticeship model can be found as the infrastructure for many learning environments in society, highlighting the value of passing on expertise from one generation to the next.

Market structures

The construction of Irvine, California, as described by Kling and Lamb, creates decentralized markets which force the balkanization of community for local residents [7]. Urban planners and large retailers with political power design neighborhoods where services are cheaper and closer to home. The result is less venturing into markets outside of the local community. Kling and Lamb note that the nature of this style of retail is correlated with lower levels of service, stating that if residents want "more personalized service, they can afford to go elsewhere and pay more for it." The power that lies with the planners and retail magnates implicitly defines the markets available to residents based on individual purchasing power, thus providing economic incentives to remain local for goods and services.

Architecture

At times, architecture is based not on foresight, but rather on the lack of it. In these cases, those in power have overlooked something of value to society. In the case of the "Y2K" problem, the early architects of encoded dates within data structures underestimated the value and longevity of their creations and discounted the need for date compatibility beyond the year 1999 [8].

Along the same theme, Tenner provides a litany of examples where the implicit values in society become apparent when the architecture of our own creations fails to conform to them [9]. He highlights society's value in the promise of technology as a sense of entitlement. The revenge effects seen in a variety of contexts speak to the power of not recognizing the consequences of architecture. For example, as a modern society, we value creature comfort. The rearranging effect of urban dwellers constantly running air conditioners, contributing to higher outside temperatures and further discomfort from heat, exposes the value of comfort when we complain that it is not there.

Finally, Landauer spends considerable space in The Trouble with Computers describing the societal value, championed by corporate power, on productivity and accuracy [10]. From mistakes in airline seat assignments, to decline in worker productivity due to lack of interface usability, to widespread interruptions in public utilities as a result of computer error, Landauer argues that these mistakes are the result of insufficient consideration of human abilities when designing technology. This view is in direct conflict with Nissenbaum's call for human

accountability [11]. Instead of blaming the computer or the design process, as Landauer asserts, Nissenbaum invokes a return to “moral values” held in society and calls for the creation of laws, social norms, and infrastructure that recaptures the need to hold humans accountable for “harm” resulting from the architecture of technological systems.

(1003 words)

1. Lessig, L., *Code and other laws of cyberspace*. 1999, New York, NY: Basic Books. xii, 297 p.
2. Olson, G.M., *Collaboratories*, in *Encyclopedia of Human-Computer Interaction*, W.S. Bainbridge, Editor. in press, Berkshire Publishing: Great Barrington, MA.
3. Bowker, G.C. and S.L. Star, *Sorting Things Out: Classification and its Consequences*. 1999, Cambridge, MA: MIT Press.
4. Shilts, R., *And the band played on : politics, people, and the AIDS epidemic*. 1988, New York, N.Y., U.S.A.: Penguin Books. xxiii, 640 p.
5. Edwards, P., *From "Impact" to Social Process: Computers in Society and Culture*, in *Handbook of Science and Technology Studies*, S. Jasanoff, et al., Editors. 1995, Sage Publications: Beverly Hills, CA. p. 257-285.
6. Lave, J., *Situated Learning in Communities of Practice*, in *Perspectives on Socially Shared Cognition*, L. Resnick, J. Levine, and S. Teasley, Editors. 1991, American Psychological Association: Washington, DC. p. 63-82.
7. Kling, R. and R. Lamb, *IT and organizational change in digital economies: A socio-technical approach*, in *Understanding the digital economy : data, tools, and research*, E. Brynjolfsson and B. Kahin, Editors. 2000, MIT Press: Cambridge, Mass. p. vi, 401 p.
8. Edwards, P., *Y2K: Millennial Reflections on Computers as Infrastructure*. *History and Technology*, 1998. **15**: p. 7-29.
9. Tenner, E., *Why things bite back : technology and the revenge of unintended consequences*. 1st ed. 1996, New York, NY: Knopf. xiii, 346 p.
10. Landauer, T.K., *The trouble with computers : usefulness, usability, and productivity*. 1995, Cambridge, MA: MIT Press. xiii, 425 p.
11. Nissenbaum, H., *Accountability in a computerized society*, in *Human values and the design of computer technology*, B. Friedman, Editor. 1997, Cambridge University Press: New York, NY. p. xiv, 320 p.