Democracy, Technology, and Information Societies

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Abstract: Computer systems, like other technologies, are socio-technical systems; they are networks of artifacts together with social practices, social relationships, social institutions and values. Viewing computer systems in this way helps to understand, at a deep level, how democracy can be affected by, and can affect, the design of computer systems. In this paper I will revisit my earlier work on the connections between the Internet and democracy. I will describe how my thinking about technology and ethics has changed and I will present a new set of claims about the ways in which computer systems are and are not related to democracy and democratic practices.

Keywords: Information society, ethics, democracy, sociotechnical systems, values, technological determinism, information technology professionals, citizenship

1. Introduction

During his life, Jacques Berleur witnessed the birth and evolution of one of the most powerful technologies in human history. What began as fairly rudimentary calculating machines, evolved first into huge mainframe computers capable of calculating numbers that were never before necessary or imaginable; then to small, 'micro' and 'personal' computers bringing incredible capabilities into small businesses and individual homes; to networks of computers and telecommunication connections that bring millions of people across the globe into instantaneous, real-time communication; to thousands of other kinds of technologies and components embedded in familiar and new products and devices; and eventually to what we refer

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to today in the all inclusive term, 'information and communication technology" (ICT).

At this moment it is difficult to see the future of ICT and the world which it will constitute. While I hesitate to speculate, it seems likely that the evolution will continue to bring individuals and organizations across the globe closer and closer together, while at the same time, the artifactual components of the technology become more and more invisible. Not only are we likely to continue to become closer in the sense that our lives will be more intensely intertwined, but we are likely to become more physically and individually intertwined with ICT. Our bodies will become more complicated ICT-flesh hybrids; many more of us will, to varying degrees, become cyborgs – human-technology combinations.

In honoring Jacques Berleur we focus our attention on "the information society" and the "issues, problems, and challenges" it poses. Because we are honoring Jacques, we want in particular to think about how we can effectively shape information societies into worlds in which we want to live. We seek, as Jacques Berleur has sought, to understand information societies in ways that help us to act in and influence the development of better information societies.

In an information society, a large number of individuals are educated for, and employed in, roles involving the design, production, maintenance, buying and selling, and use of ICT. Information societies need and depend on the special knowledge and know-how of these ICT professionals/experts. ICT professionals can deploy their expertise recklessly or cautiously, use it for good or ill, and the organization of these individuals into professional associations is an important social means of managing that expertise in ways that serve human wellbeing. ICT professionals are key players in an information society. Information societies need ICT experts and professionals who understand the values of democracy and see the connections between their work and the democratic character of the world they create through their work.

To prepare for a future of information societies, we need a framework for understanding and addressing governance, ethics, and social consequences of ICT. This is a daunting task, and I will try to get a handle on the territory by addressing its various components and identifying what I take to be the key premises that should direct our thinking about, and making decisions about, information societies. My analysis moves in sequence from ideas about democracy, to the conception of technology with which we should work, to ICT, and finally to technological choice and democracy.

2. Democracy and Technology

I begin with some basic thoughts about democracy. Democracy is a powerful idea and part of its power has to do with its uncanny combination of simplicity and complexity. The simple idea can be expressed as something like – individuals should have a say in decisions that affect their lives. Christiano, for example, writes about democracy that "broadly speaking, it is a form of decision-making wherein many of the individuals bound or affected by a decision have the opportunity to play

a roughly equal role at an essential stage in the making of the decision" (Christiano, 2001). Christiano goes on to identify participation, decision making, equality, and openness as key dimensions of democracy.

The simplicity of the idea of democracy leads to its complexity, for the simple idea can be manifested in many different forms – at different places, in different times, with differing institutions, in different cultures. Democracy has been and continues to be interpreted and reinterpreted, invented and reinvented as the world changes, because of new technology, new ideas, new circumstances, and many other kinds of change.

The simple idea of democracy is not just amenable to interpretation and reinterpretation, it promotes it. Democracies vary in how they achieve participation, decision making, equality, and openness, and these very features of democracy promote variation; that is, when individuals participate in relatively equal roles, in open environments, new ideas and new forms of democracy are envisioned and created. While the worthiness of the simple idea of democracy is rarely challenged, various versions of democracy can be and generally are challenged. Challenges to forms of democracy are encouraged by participation and openness, and this, in turn, leads to further interpretation, reinterpretation, and continuous change in democracies.

As an ethicist I understand the moral foundation of democracy to be connected to a Kantian conception of human beings as ends in themselves. The moral idea of democracy is that every human being is an end in him- or herself, worthy of respect and, hence, never to be used merely as a means to another's end. For Kant and many moral philosophers, the respect that is due to human beings is tied to their autonomy. When we treat human beings merely as means, we deny and violate their autonomy. Dictatorships and oligarchies are morally unacceptable forms of government precisely because they do not respect the autonomy of human beings (even if or when they claim to respect the value of human beings). Giving individuals a say in the governance of institutions that directly and indirectly shape their lives acknowledges the value of human beings as ends; it acknowledges their autonomy. Indeed, giving individuals a say in decisions that affect their lives doesn't just acknowledge, it calls upon and activates the autonomy of individuals.

The challenge, of course, is to figure out how, when, where, and at what point individuals should participate, what institutions are best at achieving participation, equality, openness and decision making. The challenge today is figuring out how to achieve democracy *given the complexities of modern life and the increasing interdependence of individuals within nations and across nations.*

The challenge of democracy today is the challenge of interpreting and reinventing the simple idea in the context of a global world, a global world in which regional and national economies and politics are intensely interdependent, a world in which individual and collective behavior in one place can fairly dramatically and quickly affect individuals and nation states in other places, near and far.

ICT is a major component of the intertwining of lives across the globe. While geography has always been understood to be a significant factor in democracy and politics, technology (especially ICT) has become a part of the materiality upon which politics and economy are built. For this reason, current and future reinterpretations

and reinventions of democracy will have to take ICT into account. The challenge of reinventing democracy today is the challenge of reinventing democracy in a world that is constituted by ICT. ICT is the infrastructure, the platform, the body, if you will, of the global world in which democracy must now be realized.

All of this is to say that in thinking about governance, ethics, and ICT, we have to go back to the simple idea of democracy and keep it in mind as we reinvent democracy for a world that is constituted by ICT. Of course, we should not assume that ICT is hard or fixed, i.e., that it is the only way it can be and can't be changed. Unlike nature, ICT is human-made and can be made to fit and to serve future worlds that we desire.

3. Understanding Technology

ICT is technology and misconceptions of technology often get in the way of reinventing democracy. Recent work in science and technology studies (STS) cautions against three mistakes that are often made in thinking about technology. These mistakes are important to avoid in discussing democracy, governance and ICT. The first mistake is that of presuming technological determinism; the second is the mistake of thinking that technology is merely physical objects or artifacts; and the third is the mistake of thinking that technology is neutral. These mistakes are fairly well known; they are emphasized here because they are deeply rooted in discussions of the information society, and not easily expunged from such discussions. They continue to frame discourse about the information society and direct thinking in non-useful ways.

3.1 Think Co-shaping

Recent scholarship in STS is focused on understanding the relationship between technology and society, and accounting for the forms, meanings, successes, and effects of technologies. At the core of this focus is a reaction against the presumption of technological determinism. While multiple definitions and forms of technological determinism are described and then contested by STS scholars, technological determinism seems to involve two key tenets (Johnson & Wetmore, 2007). The first tenet is the claim that technology develops independently from society. According to this claim, technological development either follows scientific discoveries—as inventors and engineers 'apply' science in some straightforward step-by-step manner—or it follows a logic of its own, with new inventions deriving directly from previous inventions. Either way, technological development is understood to be an independent activity, separate and isolated from social forces. A growing STS literature now documents the misleading aspects of this view of technological development. The literature points to a variety of social factors and forces that influence development in this or that direction (MacKenzie & Wajcman, 1999). These factors include the intentions of particular individuals or organizations, cultural notions, funding choices, pre-existing institutional arrangements, coincidental historical events, and so on.

In short, the technologies that we have today are not the result of isolated discovery of what nature allows us to do and make. The technologies we have today are products of highly complex and contingent processes, processes that are just the opposite of isolated. The processes by which technologies are developed are social, political, economic and cultural, as well as technical. Moreover, the technologies we have today are not the only possible technologies nor are they necessarily the best technologies that can be.

A second major tenet of technological determinism is that technology (when taken up and used) 'determines' the character of a society. The STS response to this tenet is complicated. While most scholars in the field agree that 'determines' is too strong a term to describe how technology affects society, most scholars concede that technology is, nevertheless, an important, and even powerful, force in shaping society. The flaw in this aspect of technological determinism is not in its claim that technology affects society but rather its failure to recognize influence in the other direction. Society shapes technology. As already mentioned, many social factors come into play influencing which technologies are developed and what design features they have. There seems to be a general consensus among STS scholars that a co-shaping or co-constitution thesis best explains the technology-society relationship. Technology and society co-produce each other – technology shapes and is shaped by society – society shapes and is shaped by technology (Bijker 1994).

The lesson here is that technology is not autonomous; it is not the way it is because that is the only way it can be; it is shaped by social forces and can be reshaped to fit the values and institutions we desire. So it is with ICT and the information society, we should not presume that ICT is the logical outcome of nature's bounty and we should not presume that ICT determines the information society, as if information societies are simply the byproduct of ICT. Information societies have developed as they have in part because of ICT but ICT, itself, is, in part at least, a product of the character of the societies that produced it. We can change the information society in part by changing ICT and we can change ICT by changing our societies. The two move in lockstep.

3.2 Think Sociotechnical Systems

STS theory calls for a shift in conceptualizing technology and consequently a shift in the unit of analysis for the study of technology. Technology is not merely material objects or artifacts. To be sure, artifacts are a component of technology, but those artifacts have no meaning or significance and couldn't even exist without social practices, social relationships, and social institutions. Social practices, social relationships, and social institutions are required to design, produce, distribute, and use technology. STS scholars argue that technology *is* and should be understood to be the combination of artifacts, social practices, social arrangements, and systems of knowledge or know-how. The combination is sometimes referred to as *sociotechnical ensembles* (Bijker, 1994) or *sociotechnical systems* (Hughes, 1994) or *networks* (Law, 1987). An artifact becomes a 'something' and it becomes functional through the social meaning and social practices around it. Artifacts cannot exist, cannot be used, and cannot have effects without social practices, social organization,

relationships or arrangements. Likewise, many social organizations or practices could not exist *as they do* without artifacts. Human-made material objects never come into being or exist in a vacuum; they are never used in a vacuum; and they never have meaning or effects in a vacuum. They are created in a social context, function in a social context, and are shaped and reshaped around complex social practices.

Perhaps the best illustration is to think about the Internet. While the Internet is often conceived of as the combination of hardware, software, and telecommunication connections, the Internet is much more than this. The hardware, software and telecommunication connections would not exist were it not for a wide variety of social institutions, political and economic arrangements, and social relationships, all of which were necessary to bring about the Internet, and continue to be essential to maintaining it. Think here of such institutions as the companies that design, produce, and market hardware and software, and the corporations and public agencies that make use of the Internet and call upon countless individuals to use it. Think of all of the regulatory or quasi-regulatory agencies such as ICANN that assure that the Internet works. Moreover, consider that users are not born knowing how to use computers and software, they have to learn how to use computers; there have to be incentives to learn and use ICT, and so on. ICT is embedded in social institutions, comes into being because of social institutions, and is wholly incomprehensible without such social institutions and arrangements.

The lesson here is to remember that ICT is not simply computer hardware, software, and telecommunications connections. ICT, like all technology, is combinations of artifacts, social practices, social institutions, and social and cultural meanings associated with the artifacts. The unit of thinking and analysis here should be sociotechnical systems or sociotechnical ensembles. In thinking about ICT and democracy, the connections between the two are hardly visible when we think of technology and ICT as merely physical objects or artifacts. Viewing ICTs as sociotechnical systems allows us to ask a whole host of questions about the democratic character of the social practices, social relationships, and social institutions that, with hardware and software, constitute ICT. This view of ICT compels us to ask questions we would not have thought to ask otherwise. Likewise, we must think of democracies as sociotechnical systems – combinations of social institutions and artifacts such as buildings, voting machines, maps, web sites, and so on. The shift in unit of analysis to sociotechnical systems reframes and helps us to see the links between ICT and democracy.

3.3 Think Technology Infused with Value

Finally, the third mistake identified in the literature of STS is that of thinking that technology is neutral. Technology is infused with values; ICT is infused with values. My earlier work on democracy and the Internet contemplated the values embedded in the Internet. I identified metaphysical, moral, material and associational values connected to the Internet (Johnson, 1997). Other scholars have identified and made salient a variety of values embedded in different computer systems and tools. Friedman and Nissenbaum (1996) provide cases illustrating bias in computer systems; Introna and Nissenbaum (2000) show how the design of search engines is

laden with value choices; and Brey (1999) argues for 'disclosive computer ethics' on grounds that it is critical to 'disclose' and make visible the values at stake in the design and use of computer technology.

In STS, the seminal piece on values and design is Langdon Winner's 1986 piece "Do artifacts have politics?" Winner identifies the relationship between technology and systems of power and authority. His account implicitly acknowledges the point made in the preceding section, that technology is sociotechnical systems. Winner argues that particular artifacts cannot exist (function) without particular kinds of social arrangements. He argues that adoption of a particular technology means adoption of a particular social order, e.g., nuclear power necessitates a complex, hierarchical system of decision making, windmills require a more decentralized form of authority. Winner also illustrates how artifacts can enforce social biases and agendas. His discussion of the bridges of Long Island, New York designed by Robert Moses in the 1930s to be at a height that prohibited public buses from reaching the beaches used by the wealthy white elite, has reverberated in the STS literature for several decades now, pointing to connections between technology and social hierarchy (Winner, 1986). Studies of gender and technology further support this claim (Wajcman, 1991; Cockburn & Omrod, 1993).

More familiar to those who study ICT will be Lawrence Lessig's claim that architecture – the architecture of computer systems and the Internet – is a form of regulation (1999). Lessig identifies four different ways that social behavior is regulated: law, social norms, markets, and architecture. Lessig illustrates how different computer architectures create different social-political orders. Of course, the point applies not just to computer architecture; human behavior is regulated (and regimented) through buildings and roads and the design of everyday objects (Latour, 1992). Of the four forms of regulation, architecture may be the one that is least recognized as such. Those whose behavior is regulated by architecture may be unaware of its influence. We drive on roads, stopping at stoplights or we accommodate to the placement of levers and switches, without thinking much about how we accommodate to the built environment and how the designs of objects tell us what to do. Yet our built environment and the technologies that are now seamlessly part of our lives shape our behavior in very powerful ways.

Of course, we must be careful here, for Winner and Lessig can be read in a way that slips us back into a version of technological determinism; that is, they both seem to be telling us that technology determines our behavior. Hence, it is important to remember that the problem with technological determinism is not that it is wrong about technology influencing social behavior, social arrangements, and social institutions. Technology does have such influence. The mistake of technological determinism is believing that the technology is the way it has to be and believing that technology cannot be shaped and reshaped to be otherwise. When architecture regulates behavior, behavior is being indirectly regulated by those who designed the technology. Decisions are made about the features of technology and believing in technological determinism hides the systems of power and authority that produced and shaped the technology.

Lest I be misinterpreted here, I am not suggesting a conspiracy theory. I am not claiming that individuals with power and authority consciously intend to regulate

behavior in this or that way through technology. Of course, sometimes they do and should as when roads are designed to get us to go certain places and not others. However, the point is that decisions are often made about technology by human beings acting through institutions and in processes, these institutions and processes shape the outcome in ways that affects thousands of people, and, most importantly, those affected are unaware of, and have no input into, the decisions that affect their lives.

Winner and Lessig are important here not because of their perspectives on technological determinism, but rather because of the salience with which they make the point about values and technology. Technology is not neutral; it constitutes social arrangements, it facilitates and constrains various forms of interaction; it embodies values of a variety of kinds, including moral, political, cultural, and economic. Winner's work is particularly interesting here because it frames the values-technology relationship around institutions of power and authority and, therefore, points to the connections between democracy and technology and especially democracy and ICT.

The lesson is clear. ICT is not neutral and in thinking about ethics, governance, ICT and democracy, we should ask who and how the co-shaping is occurring and what sorts of institutions and processes are best for sociotechnical change. In other words, we should be focused on the institutions and arrangements in which technological decisions are being made and should be made in the future.

The lessons of this foray into the literature of science and technology studies can now be summarized. While ICT seems to arrive at our doorstep ready-made, ICT is not designed in the only way it can be. ICT is shaped by an array of social factors and forces. ICT in turn shapes society, information society. ICT is not merely material objects (hardware, software, and telecommunication connections) but rather, a combination of artifacts and social practices, social relationships, and social institutions. ICT is infused with values, both in its design and in the social practices, institutions, and relationships around its development, distribution, and use. To achieve democracy in a world constituted by ICT, ICT has to be designed for democracy; its design and the social practices that constitute it must embody democratic values.

4. Information Societies, Technological Choices and ICT Professionals

The lessons from the literature of science and technology studies point to the importance of the design of ICT – design of its artifactual and social components – for reproducing the principles of democracy. And, of course avoiding 'technological determinism' is crucial to avoiding the ideology of 'fatality and the destiny of technology.' Technological determinism must be expunged from our thinking if we are to realize democratic values in constituting information societies.

As mentioned earlier, there is something right about technological determinism, namely that technology affects the character of society, and, in this respect, technological determinism is right about the importance of technology. The

technologies we develop and adopt are powerful components in constituting the societies in which we live. Nevertheless, technological determinism is the culprit when we believe that technology is autonomous, that is, when we believe that it is the only way it can be. When we believe that technology has a logical course of development, unstoppable and independent of social forces, we are paralyzed; we don't even try to understand the power, the social forces and decisions that are (covertly) deciding and choosing what technologies are developed and how they are developed. In other words, technological determinism is something like a self-fulfilling prophecy. If you believe it, it becomes true.

Of course, it is not enough to identify the culprit. We need alternative ideas that will – not just free us from paralysis but – facilitate action. The preceding analysis provides a direction for this. If we acknowledge that technology and society are inextricably intertwined, a corollary of this understanding is that technological choices *are* social choices. Technological choices are the stuff of realizing, reinventing and reinterpreting democracy. Our choices about technology (ICT) are choices about the kind of society in which we want to live.

Now, while there are many directions in which we might go from here, I want to conclude by briefly discussing two implications of acknowledging that technological choices are social choices. First, IT experts are implicitly making social and political choices when they design and produce ICT; hence, how ICT experts are educated is critically important. And, second, given that technological choices are social choices, how citizens are educated about technology is also critically important.

4.1 Educating ICT Professionals

While the term 'information society' is generally thought to refer to the economic and sociological arrangements of a society, one of the distinctive features of such societies is that they are highly dependent on ICT professionals and ICT expertise. The complexity of modern, information societies means that ordinary citizens as well as public officials cannot fully understand the building blocks of their world. Increasingly we move in the direction of a world in which citizens must know how to use ICT, but don't necessarily understand how ICT works; they don't understand the importance of technological choices and how they affect the world. Thus, the public trust and depend upon the ICT professionals who design, produce, maintain, distribute, upgrade, enhance, and use ICT. Considering how much of our world is constituted by ICT and how the world continues to move in that direction, trust in ICT professionals is not a small matter.

Recognition of the importance of trust in ICT professionals points directly to the importance of professionalism, and typically this takes us to codes of ethics for the professions of ICT. However, related to this and equally important is the education of ICT professionals. If the preceding analysis is right, then the importance of the trust we place in ICT experts expands exponentially. When, that is, we fully digest the idea that choices about ICT are not just technological choices, but social choices about the kind of world we will have and the values that are facilitated and constrained, enhanced and impeded, then we see that ICT experts aren't just making

and providing things, they are making the world we live in. They are invisible social designers and even legislators.

Thus, when it comes to the education of ICT professionals, it seems critically important that they understand the full significance of their work. ICT professionals should be educated in ways that compel them to see that it is as important for them to understand social, political, economic and value issues as to understand computer science, mathematics and physics. ICT experts of the future should be sociotechnical analysts.1 They should be capable of thinking about the values that are infused in hardware and software, and the social practices and social relationships that come with the hardware and software.

While I have only been suggestive here, I leave it as a critical challenge of information societies to appropriately educate ICT professionals so that they understand their role and responsibilities as designers and builders of society, and are discouraged from thinking of their work as simply making hardware and software.

4.2 Educating Citizens in Information Societies

In many ways the challenge of figuring out how individuals should be educated for citizenship in information democracies is more daunting than figuring out the appropriate education of ICT professionals. The easy part is to say that like ICT professionals, citizens should be given the kind of education that helps them to see the intertwining of technological, social, political, and cultural choices. The easy part is seeing how important it is to do this. The hard part is figuring out how to do it.

This takes us back to the simple idea of democracy, the idea that individuals should have a say in decisions that affect their lives. If the preceding analysis is accurate, then citizens should have some say at an essential stage in many technological choices. Some, of course, will argue that citizens already do have such a say, through the market. This, I would argue, is only true of certain kinds of products, but in any case, my concern here is not so much with how citizens have a role in decision making but rather with the prior issue of *what sort of education will facilitate their participation in technological decision making.*

We can't expect citizens to understand technology in the way that experts do. On the other hand, they have to understand enough to participate in meaningful dialogue. Thus, a major challenge for information societies is figuring out this balance.

5. Conclusion

To summarize, in rising to the challenge of the future of information societies, we should avoid the three mistakes I mentioned above. We should reject the 'ideology of the fatality of technology.' We should adopt a view of technology as sociotechnical systems, sociotechnical systems that are infused with value. This will

1 This term was suggested to me by Benjamin Cohen in describing the kind of education engineers should receive.

allow us to see the links between technology and democracy. It will focus our attention on reinventing democracy in a world that is constituted by ICT. Moreover, two keys to shaping future information democracies are figuring out the appropriate education for ICT professionals and figuring out what citizens need to know in information democracies. Addressing these two issues will help to build systems of trust between experts and citizens. Addressing these two issues is essential to developing information democracies.

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