

Internet Technologies in China: Insights on the Morally Important Influence of Managers

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ABSTRACT. Within Science and Technology Studies, much work has been accomplished to identify the moral importance of technology in order to clarify the influence of scientists, technologists, and managers. However, similar studies within business ethics have not kept pace with the nuanced and contextualized study of technology within Science and Technology Studies. In this article, I analyze current arguments within business ethics as limiting both the moral importance of technology and the influence of managers. As I argue, such assumptions serve to narrow the scope of business ethics in the examination of technology. To reinforce the practical implications of these assumptions and to further illustrate the current arguments, I leverage the recent dialog around U.S. Internet technologies in China. The goal of this article is to broaden that which is morally salient and relevant to business managers and business ethicists in the analysis of technology by highlighting key lessons from seminal STS scholars. This article should be viewed as part of a nascent yet burgeoning dialog between business ethics and Science and Technology Studies – a dialog that benefits both fields of study.

KEY WORDS: actor-network theory, China, ethics, Google, Inc., innovation, internet, pragmatism, Science and Technology Studies (STS), socio-technical systems, technology

So it's not just a question of technology...I almost wish it were because then the technological solutions we would all hope for may be there (*The Internet in China*, p. 31).

Gross, U.S. State Department

Cisco sells the same equipment to China that we sell worldwide... (*The Internet in China*, p. 80).

Mark Chandler, Cisco.

...we do not have the influence or leverage to pressure the Chinese into changing their regulations or refraining from enforcing them (*The Internet in China*, p. 46).

Jack Krumholtz, Microsoft

Based on what we know today and what we see in China, we believe our decision to launch the Google.cn service in addition to our Google.com service is a reasonable one, better for Chinese users and better for Google (*The Internet in China*, p. 47).

Elliot Schrage, Google, Inc.

Introduction

Business has a special role within the technological lifecycle. Firms are the mechanism through which technology is introduced to the market and are made useful (Afuah, 2003). Firms house the many engineers and scientists who invent, innovate, and maintain technology (Schumpeter, 1942), and even those inventions hatched within universities come to see the light of day through innovative firms (Shane, 2002). Further, the initial design and introduction of a technology to a community is fraught with consequences to the behavior (Winner, 1986), roles (Barley, 1990), and responsibilities (Latour, 2000) of individuals, groups, and communities. Business oversees an intense and important phase within the entire technological lifecycle.

This early phase is also fraught with information that is ambivalent (Weick, 1995), uncertain (Knight, 1921), and fast-paced (Eisenhardt and Martin, 2000).

To work effectively in such an environment, managers use tools or heuristics to make sense (Weick, 1995) of the information and cues (Kiesler and Sproull, 1982). Rather than consider every combination and permutation of the numerous cues, managers consider items of both relevance and salience to their role (Dutton and Duncan, 1987; Kiesler and Sproull, 1982; Maitlis and Lawrence, 2007). In other words, managers consider those issues which are deemed *important* and over which they have *influence*.

While technology is the subject of many articles within business ethics, I argue that a prevalence of time- and type-dependent arguments work to streamline the topics under consideration for managers by diminishing the managerial influence over and the moral importance of technology. Such arguments feed into the filtering systems being utilized by managers and work against the findings of STS scholars who have enlarged the morally important influences of managers and the scope of business ethics.

The goal of this article is to continue a nascent yet burgeoning dialog between business ethics and Science and Technology Studies (STS) by exploring the morally important influence of the managers of technology from the perspective of both academic disciplines. After illustrating the impact of time- and type-dependent arguments within business ethics, I examine the work of seminal STS scholars and develop insights for business ethics. Throughout the article, I leverage the dialog around U.S. companies deploying Internet technologies in China. Rather than analyzing the case, however, I use the rationales and comments made by members of Congress, representatives of U.S. companies, government officials, activists, and scholars to (1) demonstrate the practical application of the time- and type-dependent arguments made in theory and research, (2) extend current arguments to their logical conclusions, and (3) illustrate the power of applying the systems approach from STS. By controlling the case (all comments are centered on U.S. companies deploying Internet technology in China), I am able to demonstrate the variation in rationales offered for making morally important decisions about technology contemporaneous to illustrating the practical implications of arguments made within academia.

Ethical analysis as time- and type-dependent

“Problems do not present themselves to ...[managers] as givens” (Weick, 1995, p. 9). Rather, as understood from social cognition theory (Kiesler and Sproull, 1982) and sense-making (Weick, 1995), managers make sense of issues (Weick, 1995) and solve problems (Maitlis and Lawrence, 2007), which are both relevant and salient to their role within an organization (Kiesler and Sproull, 1982) through the use of heuristics, biases, and framing (Kihlstrom and Laffont, 1979).

Managers identify issues relevant to the scope of their role and responsibilities as those issues over which they have some influence (Dutton and Duncan, 1987). Similarly, saliency of issues increases when moral implications and consequences are noticed (Jones, 1991). Such morally important issues are more likely to be noticed and acted upon. This filtering system emphasizes the importance in identifying items as both relevant and salient since many issues fall outside this designation and is not considered by managers. More specifically, and significant to business ethicists, if certain issues are deemed *not* relevant by being outside the influence of managers or *not* salient by lacking morally important consequences, these issues are not considered.¹

This taxonomy of moral importance and managerial influence as depicted in Figure 1 is congruous with the boundary conditions of business ethics as a discipline. Business ethicists, in their effort to guide managerial and organizational behavior, assist managers and executives in perceiving their possible influence and the situation’s import through the use of theoretical tools and approaches such as moral imagination (Werhane, 1999) and stakeholder theory (Freeman, 1984, 1994, 2000) to name only two of many. In view of Figure 1, business ethicists move the conversation into Quadrant IV and develop tools to assist managers in working through the morally important issues within their influence.

These boundary conditions are narrowed in the current analysis of technology within business ethics. In the case of technology, we find, what I term, both time- and type-dependent arguments, which diminish both the moral importance and influence of managers in their decisions about technology. In order to demonstrate the presumptions and implications of each approach to technology and business ethics, this article examines the examples of both

		Situation's Import	
		Limited moral importance	Morally important
Managers' influence	Limited influence	II. identification of black holes	I. surgery on children
	Influence	III. choosing beverages at lunch	IV. designing employee benefits or developing Internet technology
World of Business Ethics			

Figure 1. Morally important influences.

time- and type-dependent arguments. This list should not be considered exhaustive – the examples, however, should be considered illustrative. While the arguments often add to the discussion of technology and ethics as illustrated in Figure 2, the assumptions outlined below mistakenly convey that technology is either outside the influence of managers or not morally important thus leaving little room for business ethicists in the analysis of technology.

Ethical analysis as time-dependent

Time-dependent approaches to technology argue that managers have a morally important influence at *particular phases* of the technology's lifecycle. These arguments limit the influence of managers and the corresponding ethical analysis to specific phases of the lifecycle independent of the technology under consideration. Extreme technological determinists' arguments place technology outside the influence of

society *throughout its lifecycle* because (1) we are a product of technology, (2) technology makes alternatives unavailable, and (3) technology alters the possibilities of resisting technology by destroying traditional modes of resistance (Koehn, 1999). While emphasizing the role of technology in society, these arguments render analysis of the ethical implications or moral decisions of technology as a completely futile exercise – we in society have no control over evolving technology (Martin and Freeman, 2004). Currently popular is a modified technological determinism argument. The ethical lag (Kracher and Corritore, 2004) or cultural lag theses (Marshall, 1999) argue technology advances without ethical consideration *during early phases* due to the technological imperative – i.e., technology that *can* be developed *is* developed.² Managers have no influence over design and development due to reasoning that is both practical (value decisions are too expensive and time consuming) and theoretical (scientists and engineers are objective and amoral).

For social determinists, while managers may have influence or make decisions about technology *during design, development, and deployment*, these decisions have little moral importance as users are assumed to adopt, choose (Allinson, 1998; Poesche, 1998), and use (Peace et al., 2002) technology ethically regardless of the technology's designed features and functions (Drake et al., 2000; Herschel and Andrews, 1997). Consequentially, “features and attributes of technology ought not to be conceptualized as determining behavior” (Herschel and Andrews, 1997, p. 160). Doing so may lead one to mistakenly blame technology when it is merely the conduit for unethical

Argument	Positive Implications	Negative Implications
<u>Time Dependent –</u> managers have a morally important influence at particular phases within a technological lifecycle.	Influence varies throughout the lifecycle. Users should retain responsibility for the use of technology. Usually emphasizes moral import of technology.	Influence is limited. Specifically diminishes the important early design phase.
<u>Type Dependent –</u> categories of technology determine the moral import of technology.	Influence is always possible. Attempts to streamline topics for consideration through generalizing types of technology. Technology as sometimes morally important.	Ignores context of use as influencing moral implications. Aggregates design details to prevent feature-level analysis of technology.

Figure 2. Implications of time- and type-dependent arguments.

behavior (Drake et al., 2000). While social determinism arguments may assume managers to have a voice in their decisions, idealized versions veer toward making that decision irrelevant during design and innovation.

We see evidence of these time-dependent arguments in the case of Internet technologies in China. After the news broke about the “Great Fire Wall” of China (Chandler, 2006; Thompson, 2006) comprised of Cisco routers and used by the Chinese authorities to limit Internet search and communications, Congress convened a hearing on the role of U.S. Internet companies in China (*The Internet in China*). Further exacerbating the situation, Microsoft and Yahoo! had turned over personal information about their customers which led to the imprisonment of Chinese dissidents for their Internet communications (*The Internet in China*).

During the congressional hearing, in February 2006, as illustrated in the official transcript (*The Internet in China*), Representative Smith (D-WA) argues against blaming the U.S. companies for the actions of the Chinese authorities:

If a “U.S. tech company does business in China. Does it get better? Is it less repressive? Does China move forward? I don’t think so, not in the least bit. I think lashing out at the companies there as sort of enabling this is a little absurd. China is what China is and if the tech companies leave that’s not going to change” (*The Internet in China*, p. 23).

Veering toward a social determinism argument, technology for Smith has little influence during use. Accordingly, attributing any role to U.S. Internet technologies, even a modified ‘enabling’ role, is ‘absurd.’ Consequently, “the potential for good or ill depends largely on the intent of the user” and the technology introduced in China is presumed to be “agnostic” (*The Internet in China*, p. 7).

Cisco’s Chambers attempts to limit Cisco’s role in the use of their routers in China by bearing towards the technological imperative in arguing that the job of design and deployment does not include making value judgments. In fact, Cisco acts “in accordance with the principles that you’ve [Congress] established for us” (*The Internet in China*, p. 79). As such, Chambers sees no responsibility for the use of their product: “we [Cisco] don’t see the implementation that is done by the user” (*The Internet in China*, p. 79). In other words, while Cisco routers may, in

fact, have implications to users and other constituents, it is not relevant to Cisco’s role as designer and developer of a technology. Microsoft echoes the technological imperative by placing such value-laden decisions in the hands of the government: “it is therefore, the responsibility of governments with the active leadership of the United States, to seek to reduce or reconcile these differences in order to protect the value and power of the Internet on a global basis” (p. 46). Robert Reich, former Labor Secretary, takes the next logical step by evoking the more practical assumptions of the technological imperative, “There’s no American foreign policy that dictates at all what Google or Yahoo! or any of them ought to be doing. And therefore, we can’t expect these companies to do it out of their own generosity...Google doesn’t have a corporate conscience” (Kudlow and Company, 2006). Contrary to the work of STS scholars below, corporations cannot be expected to take the moral implications of their technologies into consideration according to the above reasoning. In the extreme, corporations have no conscience.

Where the technological imperative precludes us from an ethical discussion of technology rendering the analysis irrelevant to the role of the manager (e.g., Cisco’s Chambers), social determinism arguments make such deliberations not morally salient as technology is later constructed in use (e.g., Smith). However, ignoring technology during the early phases of the lifecycle cordons off business ethicists from the important design phase where value-laden functionality becomes semi-permanent features of the technology. Authors from management and technology studies have eloquently articulated the problems attempting to change technology once it is deployed (Hughes, 1994; Orlowski, 1992; Winner, 1986). Technology scholars agree that the longer technology is deployed and in use, the harder it is to change thereby rendering the early phase of design both important and, counter to the above arguments, most susceptible to change.

Ethical analysis as type-dependent

Rather than focusing on the phase of the lifecycle, type-dependent arguments rely upon features, attributes, and category of the technology as the deciding

factor for ethical consideration. Type-dependent arguments limit the moral import and corresponding ethical analysis to specific types of technology independent of context.

Two lines of reasoning fall from type-dependent arguments. First, the *ethical issues change* based upon the technology category regardless of the context of the situation – the different categories of technology and innovation *create* new and different ethical issues (Donaldson, 2001). STS scholar Deborah Johnson counters that “behaviors and issues cannot be recognized as having moral significance unless they connect to a moral notion that we already have” and, therefore, “technology cannot suddenly thrust us into wholly unique moral territory” (Johnson, 2001, p. 17).

A second and related line of reasoning follows: once moral issues have been resolved for a category of technology, these *issues are resolved for all communities* of users regardless of the environment and particular situation. Stieb (2001) offers an example of this second line of reasoning when he argues that managers facing only “emergency situations, emergent technologies and cases, and situations involving high or immediate risk or secrecy, as well as situations that involve interpretation of present or future law” (Stieb, 2001, p. 245) need consider the moral implications of deploying or using a technology. The author argues that in managing more mundane technologies, executives should rely on legislation or other experts. In his argument, Stieb assumes typology – new, emergent, old, and traditional, commodity, etc. – as an attribute of technology regardless of the social context. In an example used by Stieb, glue, a seemingly mundane technology within the United States, is also considered mundane amoral in Honduras.³ Therefore, when a community in Honduras absorbs this technology, it is the *technology* – in this case, adhesive materials – that determines the moral worth of the issue and the responsibility of the business manager.

Similarly, when testifying before Congress on Cisco’s role in developing and maintaining The Great Firewall of China (*The Internet in China*, 2006), Mark Chandler of Cisco stated, “Cisco does not customize or develop any specialized or unique capabilities in order to enable different regimes to block access to information. Cisco sells the same equipment to China that we sell worldwide” (*The*

Internet in China, p. 80). For Chandler, the fact that Cisco routers are used responsibly and within the law in the United States demonstrates the effectiveness and values of the technology called ‘Cisco Routers.’ That Chinese authorities use this technology for surveillance and control, which runs afoul of U.N guidelines (Bureau of East Asian and Pacific Affairs, 2006), is not relevant to Cisco – the moral issues concerning Cisco routers have been resolved and codified into norms and laws previously. Similarly, Microsoft’s reliance on Chinese authorities “changing their regulations or refraining from enforcing them” (Krumholtz, *The Internet in China*, p. 47) in order to create a mindful, responsible technology implicitly assumes that (1) features of technology can be aggregated into categories which are regulated and (2) private, non-regulated design decisions have no bearing on the moral implications of their technology, therefore, (3) Microsoft has no responsibility to consider the consequences of their design without explicit regulations.⁴

These arguments, which rely upon the attributes and categories of technology as determining moral importance, make two important assumptions. First, the context of the situation and the features of the users have no influence on the eventual moral implications of the technology. For authors or scholars making this argument, corporate and managerial responsibility for a technology stops once a community, any community, has developed the appropriate norms, legislation, and social practices necessary to successfully utilize the technology. When a new community (e.g., Honduras or China) is introduced to an innovation (liquid glue or the Internet), the onus for responsible, correct use is on the new community since the innovation ‘works’ well elsewhere.⁵

Second, the features and functionality of the technology are glossed over and aggregated into categories and types of technology. The impetus for ethical consideration lies solely in the category or attribute of the technology rather than in the interaction between the technology and its users. An employee monitoring system may have default settings to notify users of the monitoring, to discard accumulated data every 2 weeks, and to require authorization to identify the employee associated with specific activities. The specific features of such a monitoring technology make a difference in its eventual use by

individuals and its moral impact on communities (Martin and Freeman, 2003). Similarly, an Internet search technology can filter results, notify users of filtering, and protect personal information depending on its design. Google, Microsoft, and Yahoo! are competitors in offering consumer Internet services in China and all came under similar scrutiny in the press and in front of Congress (*The Internet in China*). Yet, each organization made different design decisions about whether to store identifying information within China, when to pass on possibly incriminating information to Chinese authorities, and how to notify users of Chinese or search engine censorship. Categorizing certain types of technology as being amoral, moral or immoral irrespective of the features of the technology or the specifics of the situation ignores many important and morally rich technological situations.

Implications of time- and type-dependent arguments

These time- and type-dependent arguments are limiting in the type of questions asked and issues considered as summarized in Table I. The practical implication of time-dependent arguments is the

narrowing of responsibility of U.S. companies for the eventual use of their technologies in China. In contrast, type-dependent arguments manifest themselves in the attempt to categorically declare an ethical issue resolved regardless of the novelty of Chinese use.

Together, time- and type-dependent arguments combine to limit the moral import and influence of managers and to narrow the scope of business ethics and technology (see Figure 3). Where time-dependent arguments limit the influence of managers over technology to specific phases of the lifecycle independent of the technology under consideration, type-dependent arguments limit the moral import to specific types of technology independent of context.

Ethical analysis of socio-technical systems

In contrast to the arguments illustrated above, the field of Science and Technology Studies (STS) developed alternative explanations for the interaction between technology and society. By examining technology within a socio-technical system, a system comprised of material and non-material actors with continually changing members and relations, Science

TABLE I
Business ethics arguments in practice

Taxonomy of arguments	As evidenced in dialog around U.S. Internet companies in China
<i>Time-dependent arguments</i>	
Technological imperative	“It is therefore, the responsibility of governments with the active leadership of the United States, to seek to reduce or reconcile these differences in order to protect the value and power of the Internet on a global basis” (p. 46) “There’s no American foreign policy that dictates at all what Google or Yahoo! or any of them ought to be doing. And therefore, we can’t expect these companies to do it out of their own generosity...Google doesn’t have a corporate conscience” (Kudlow and Company, 2006)
Social Determinism	“the potential for good or ill depends largely on the intent of the user” and the technology introduced in China is presumed to be “agnostic” (<i>The Internet in China</i> , p. 7) “I think lashing out at the companies there as sort of enabling this is a little absurd. China is what China is and if the tech companies leave that’s not going to change” (<i>The Internet in China</i> , p. 23)
<i>Type-dependent arguments</i>	
Ethical issues as resolved based on category of technology	“Cisco does not customize or develop any specialized or unique capabilities in order to enable different regimes to block access to information. Cisco sells the same equipment to China that we sell worldwide” (<i>The Internet in China</i> , p. 80)

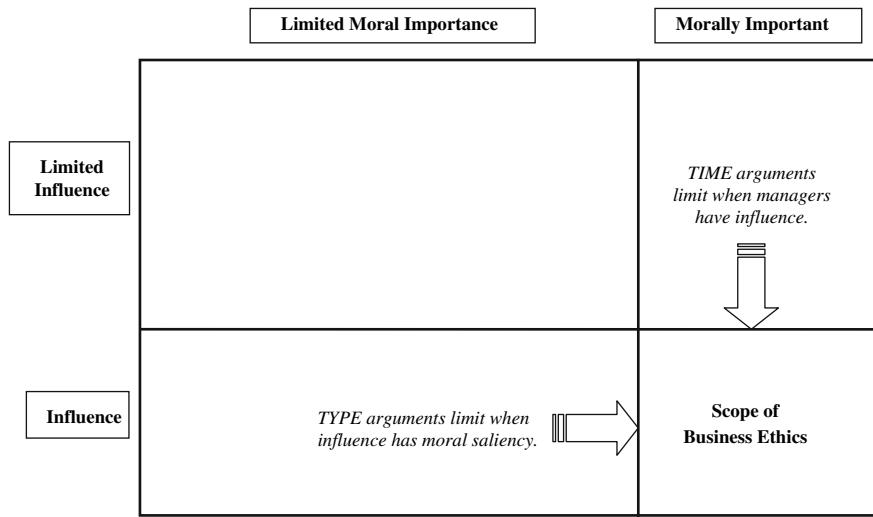


Figure 3. Scope of business ethics I.

and Technology Studies has continued to explore the co-shaping relationships between technologies and social groups. As illustrated below, some STS scholars focus primarily on the *impact of technology* on communities and demonstrate the consequences and moral import of design decisions. Others focus more on the *impact of social groups* on technology and demonstrate the various influences different groups exert on a slowly stabilizing technology. However, all work within the realm of socio-technical systems and seek to further understand different relationships between technology and society.

I turn now to the seminal work of four STS authors (Bijker, 1995; Callon, 1986; Latour, 2000; Winner, 1986) to glean insights for business ethicists (see Table II for a summary). In doing so, I highlight two important contributions from STS scholars for business ethicists to consider: the nuanced managerial influence over technology and the range of technologies with moral implications.

Increased managerial influence

Through an examination of bicycles, plastic, and light bulbs, Wiebe Bijker (1995) refined the social construction of technology (SCOT) approach to the development of technology in his book, *Of Bicycles, Bakelites, and Bulbs*. For Bijker, design and development is a social, negotiated process by relevant social groups from initial design idea through

technological stabilization. The relationships between members of the socio-technical system do not assume profit, power or politics as necessary conditions for their co-shaping interaction. Rather, relevant social groups are identified as those groups of individuals who influenced the social process of development through a historical examination of a technology (Bijker, 1995, pp. 45–49). In addition to design and development, the process of stabilization and the determination of effectiveness are also continually constructed by these social groups. For business ethicists, various groups have a vested interest in the development of a technology and subsequently impact the process of innovation. Bijker highlights the very social process of design and development which runs counter to any contention of the technological imperative or the autonomous development of technology (Bijker, 1995, p. 45).

Where Bijker focuses on human-based relevant social groups, actor-network theory is decidedly pragmatic in eschewing any inherent categorization of members of the network – whether they be material or non-material. Callon demonstrates the power in not prioritizing members of the system *a priori* a detailed examination, and his designation of scallops as actors in a technological network epitomizes the flexibility of actor-network theory (Callon, 1986; Law and Callon, 2000) within STS. The terms ‘users’ or ‘humans’ are but one type of member of the network; the terms may be useful but

TABLE II
Key lessons from STS

Scholar	STS	Implications for business ethics
Bijker (1995)	Highlights the very social process of design and development	Counters contentions of the technological imperative or the autonomous development of technology
Callon (1986)	Opens up the socio-technical system to both material and non-material actors as both influencing and being influenced by a technology	Broadens the designation of groups with influence during development and eschews <i>a priori</i> prioritization of members of the user community
Winner (1986)	Highlights the range of technologies with moral implications which are available to study within socio-technical systems	Renders assessments of the moral implications of any technology without first studying the artifact in its interactions with other members of the social system inadequate
Latour (2000)	Illustrates technology not only impacts individuals, organizations, and communities, but also takes on responsibilities and roles within a system	Renders arguments of technology's lack of moral importance and 'value-neutrality' more difficult to legitimately incorporate in theory, research, and practice

need not carry forth any greater influence or importance. Both Bijker (1995) and Callon (1986) can be viewed as natural extensions of the work of Kuhn (1962) and Rudner (1953) who identified the tremendous influence of communities of scientists, engineers, and technologists during the development of science and technology. Callon (1986) and Bijker (1995) merely broaden the designation of groups with influence during development to those outside the scientific community.

Increased moral import

As Winner (1986) eloquently argues in his seminal piece "Do Artifacts Have Politics?," all types of technology carry intentions and values throughout its lifecycle. While some technologies may be more interesting than others, it is difficult to rationalize parsing out specific technologies as not morally important categorically. For Winner (1986), even bridges and tomato harvesters carry values for the direction of future user communities: bridges to Long Island were designed too low for public buses thereby limiting those who could easily frequent Jones Beach; tomato harvesters disrupted the labor markets and instigated the development of tomatoes

which could withstand the being 'picked' by such machines (Winner, 1986). For business ethicists, Winner highlights the range of technologies with moral implications which are available to study within the socio-technical system. In consideration of Winner's examples, one could not adequately assess the moral implications of any technology without first studying the artifact in its interactions with other members of the social system.

Latour (2000) continues in this vein by exploring the responsibility assumed by certain technologies when technology impacts the behavior and roles of individuals, groups, and communities. Through the examination of door groomers – those mechanisms which automatically return the door to the closed position upon opening – and automatic seat belt notifications, Latour identifies the manner in which members of a social system share responsibility for an overall task or goal including material artifacts. For Latour, developers and innovators *prescribe* (Akrich, 2000) future delegations of responsibility during design. For business ethicists, Latour illustrates technology not only impacting individuals, organizations, and communities but also taking on responsibility in a larger delegation of roles and duties. Latour's insights render arguments of technology's lack of moral importance and 'value-neu-

trality' more difficult to legitimately incorporate in business ethics theory and research.

We can see the implications of taking a broader and more contextualized approach to technology by comparing Figures 3 and 4. The move away from deterministic language to the acknowledgment of the co-shaping of technology and society broadens the areas for ethical analysis. The area of morally important influences of managers is larger for those within STS, and seemingly mundane technologies such as door groomers (Latour, 2000), bridges (Winner, 1986), and bicycles (Bijker, 1995) have consequences – morally important consequences – to individuals, groups, and communities. As such, the scope of business ethics in its examination of technology is larger due to the work of STS scholars.

In order to fully understand technology, STS scholars examine a technology within its broader network of individuals and communities who *shape and are shaped by* the technology. As Johnson summarizes, the members of socio-technical systems *co-shape* each other (Johnson, 2000). For business ethicists, managers shape technology and those influences are morally important because the technology shapes individuals, groups, and communities. Rather than relying on time or type as a trigger for ethical analysis or as determining a manager's morally important influence, the features and context of a specific system are examined in order to understand the full implications of technology.

Internet companies in China

Situating technology within a broader social network illuminates the importance of both the technology and the technology's relevant social groups (Bijker, 1995) or stakeholders (Martin, 2006) to understanding the effectiveness of the technology. Such an approach would have highlighted the great difference between glue within its existing network of users and communities in the United States and glue placed within a very new and very different social network in Honduras. The physical artifact may have been the same, however, the surrounding context, systems, and stakeholders changed dramatically. Similarly, examining Cisco routers within the Chinese socio-technical system illuminates new issues to address rather than relying upon existing regulations and U.S. norms as defining the morally import of the routers. Many scholars and NGOs take such a nuanced approach to analyzing the issues and possible solutions to current Internet technologies in China.

First, rather than arguing for a categorical banishment of U.S. companies from doing business in China, these scholars view Internet technology as one piece of a larger system. Libby Liu, of Radio Free Asia, notes the network of human proxies which works with Internet technologies in China:

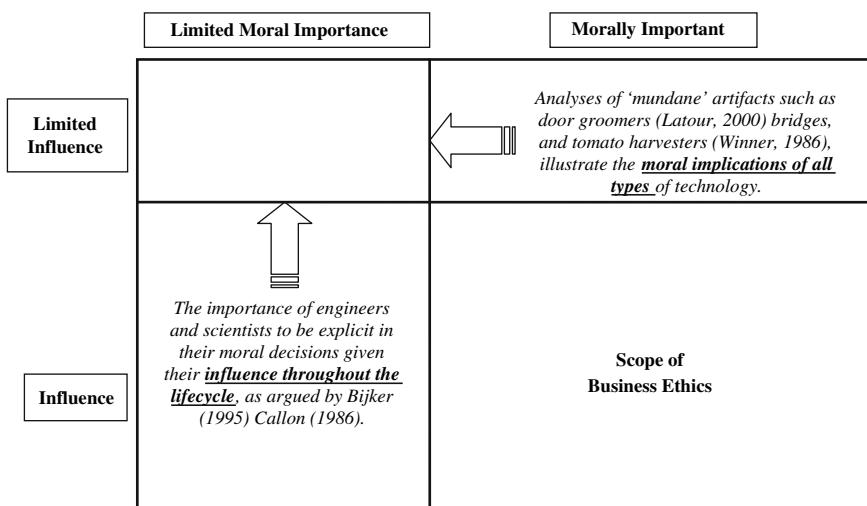


Figure 4. Scope of business ethics II from STS.

This network is so informal it has no shape but is very much alive. Message boards, e-mails, blogs, and instant messages pick up where the Internet has blocked us. Friends and family in third country post our articles on their own websites and they pass on those web addresses (*The Internet in China*, p. 93).

To understand how a specific Internet technology works within China, one must understand this larger network of human and material artifacts working together to perform the task of circumventing Chinese authorities. Counter to the comment that nothing would be different should U.S. companies pull out of China, Liu acknowledges the positive role U.S. technologies *can* have in empowering Chinese users depending upon both the features of the technology and the context of the social system.

While Liu's is a system designed to *circumvent* Chinese censorship, others similarly argue the *implementation* of censorship is "not just a question of technology" (*The Internet in China*, p. 31). Rather, U.S. Internet technology is used within a system of laws, groups, propaganda, police, friends and family, NGOs, and other technologies (e.g., Gross (in *The Internet in China*, p. 31), Qiang (2006, p. 2); Liu (in *The Internet in China*, p. 93)). Reminiscent of Latour (2000), scholars of the Internet in China begin to ask what role and responsibility (e.g., Blumenauer, *The Internet in China*, p. 14; Fortenberry, *The Internet in China*, p. 13) U.S. companies and the technologies should have in such a system.

Second, rather than aggregating varying features and assessing entire categories of technology, such a systems approach also leads to a detailed analysis of features such as (a) where e-mail information is physically located (Smith, *The Internet in China*, p. 31; Schrage, *The Internet in China*), (b) how proxy servers are leveraged or circumvented (Keith, *The Internet in China*); and (c) what type of notification of privacy (Serman, *The Internet in China*, p. 12) and censorship (Hom, *The Internet in China*, p. 102) is offered. In sum, those examining the Chinese Internet socio-technical system think beyond "isolated technologies" (Hom, p. 102) and see implications that "transcend individual companies own relationship" to China (Qiang, *The Internet in China*, p. 2). By examining a larger socio-technical system, both the questions and answers change towards a

more nuanced understanding of what works for all members of the system.

Consider Hom's reaction to the claim that Internet technologies are agnostic or neutral:

[Internet technologies are] "only neutral if we ignore the context and we ignore the predictable consequences of their deployment and application given a known, well documented, repressive, legal, social, and police infrastructure. And they're only neutral if we ignore the participation of the industry in actively seeking access into selling the software and the equipment" (Hom, *The Internet in China*, p. 99).

Hom's statement exemplifies the co-shaping relationships between technology and communities: Internet technologies in China play a role in the local social system and U.S. Internet companies have a morally important influence in designing value-laden features with moral implications.

Implications and conclusion

As Coates (1982) stated 25 years ago, "the new immorality is to choose to act in ignorance of future consequences" of technology (p. 239). This article has attempted to lift a veil of ignorance by, first, explaining the negative impact of time- and type-dependent arguments and, second, illustrating the how the work within STS positively informs business ethicists in their study of technology. Acknowledging the morally important influences of managers of technology broadens the work for business ethicists. I now turn to specific implications to maintain this dialog between the fields.

The socio-technical system approach gives us a tool to consider and analyze who impacts and is impacted by technology. Such an approach broadens the scope of business ethics, but not to extremes. This article is not arguing that business ethicists can and should weigh in on every decision made for every technology. As noted by John Stuart Mill, any idea taken to illogical extremes falls apart (Mill, 2002, p. 70). Rather, the context of both the technology and the various stakeholders are considered when examining the moral importance of any given situation.

Specifically, as with many network or system analyses, the unit of analysis changes from the members themselves to the relationships among the members of the socio-technical system. For business ethicists, traditional ethical frameworks are available with the subject of examination being the relationships between a specific technology and other members of the socio-technical system. For example, the issue of Internet search technology in China is examined much more effectively by studying a specific technology (e.g., Google.cn) in its relationships with specific actors (e.g., users, NGOs, cyber-cafes, Chinese authorities, content providers, U.S. government, cyber-police, etc.) and then using ethical frameworks to determine the effectiveness, fairness, consequences, intent, and sustainability of the relationships and the system. Future research questions might include:

- What are the moral implications of different types of relationships between members of a system?
- What concepts or tools would help researchers and practitioners best study the relationships within a socio-technical system?
- What is the responsibility of innovators for the technology they design, develop, and take to market?

Finally, while this article has attempted to illustrate specifically how the findings from Science and Technology Studies inform business ethics, a parallel project would translate a more enlightened approach to business issues for STS. While STS as a field contains many nuanced and contextualized studies of technology, the field lacks an understanding of the needs, goals, and context of business. Without a solid understanding of or appreciation for theories of the firm, management decision-making, organizational behavior or strategy, STS scholars are at a disadvantage to translate their work into the world of management. Similar to a call for greater integration between the fields of organizational studies and information systems (Orlikowski and Barely, 2001), business ethicists and STS scholars have overlapping fields of study and goals for research. Much can be learned from further integrating the works from the two fields.

This article has continued a burgeoning dialog between business ethics and Science and Technology Studies (STS) by exploring the morally important influence of the managers of technology from the perspective of both academic disciplines. In doing so, I have argued for the increased attention of business ethicists toward technology and, specifically, the initial phases of design and deployment through systems approach. To paraphrase Wicks and Freeman (1998), ignoring the moral import of technology does not render the issues amoral; it only means we do ethics badly. As is illustrated by the work of STS scholars and the example of Internet companies in China, the consequences of diminishing the morally important influences of managers of technology has never been more evident.

Notes

¹ The term ‘morally important influence’ is also referenced in Freeman’s article on the separation thesis (1994).

² Unfortunately, this type of argument is self-fulfilling. By proclaiming the beginning phases of the technological lifecycle as off limits, the design, development, deployment, and, perhaps, choice of technology proceeds without explicit moral consideration.

³ The H.B. Fuller Case (Bowie and Lenway, 2002) outlines the issues that befell H.B. Fuller and the citizens of Honduras when the company introduced Resistol as an adhesive product in their company. The glue was not an issue in the United States; however, upon introduction within Honduras, the street children began snorting the fumes of the glue and becoming addicted. The children were named “Resistolero” in honor of the glue.

⁴ Milton Friedman (1970) counseled against this very argument in his frequently read and oft misunderstood article “The Social Responsibility of Business is to Increase its Profits.” As Freidman notes, if managers begin to offload the heavy lifting of moral implications and ethical considerations to those outside business, government will gladly step in and assume the role of arbiter of ethics. In Friedman’s words, separating ‘social’ and ‘business’ responsibilities *leads to socialism* through the potential of increased government regulation. Note, also, the similarities to Freeman’s warnings against the separation fallacy (2000).

⁵ See Stieb (2001) for this argument on Honduras and Resistol.

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