



# Organizing and reframing technological determinism

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**Fernando de la Cruz Paragas**

University of the Philippines Diliman, Philippines

**Trisha TC Lin**

Nanyang Technological University, Singapore

## Abstract

Technological determinism (TD) has been critiqued as reductionist, ahistorical, and simplistic. This article, however, presents its complexity by showing four of its typologies according to the axes of objective/subjective dimensions and regulation/radical change sociologies based on Burrell and Morgan's *Four paradigms for the analysis of social theory*. Through a survey of the literature and theoretical arguments about new media and their possible consequences on political, economic, and cultural systems, the article shows how TD and social determinism constitute a continuum, rather than a dichotomy, of theories about the relationship of technology and society. It recommends the revisiting of Burrell and Morgan's concepts and their utility in organizing other communication theories.

## Keywords

Burrell and Morgan, framework-building, social determinism, technological determinism

Technological determinism (TD; Chandler, 2002; Craig, 2001; Rogers, 2000) expounds on the “links between the dominant communication technology of an age and the key features of society” (Burnett and Marshall, 2003: 9). Although heavily criticized as

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## Corresponding author:

Fernando de la Cruz Paragas, Department of Communication Research, College of Mass Communication, University of the Philippines Diliman, Plaridel Hall, Ylanan Road, UP Diliman, Quezon City 1101, Philippines.  
Email: fcparagas@upd.edu.ph

ahistorical, reductionist, and simplistic (Chandler, 2002), TD has been revisited by many theorists with the introduction of new communication technologies such as the Internet (Lehman-Wilzig and Cohen-Avigdor, 2004). Accordingly, the reviews of related literature in recent articles on media and society discuss TD and other theories which align with or contradict it.

The emergence of new media also necessitates the revisiting of TD. With individuals becoming active audiences that control rather than be effected upon by media in a multiple and constantly negotiated reality, TD may seem to have lost much of its credence. For parallel to the academic ferment has been a radical change in the face of technology itself. From legacy media that are immutable in their delivery of content, communication technology has become intelligent and interactive—a shift that has since resulted into a re-understanding of the nature of the audience (Livingstone, 2003). However, this nuance in technology and the audience has since reinvigorated the TD debate, in which innovations such as the personal computer and mobile telephones have become malleable and hegemonic (Merelman, 2000).

A common way to discuss TD has been to distinguish between its hard and soft approaches. Hard determinism, according to scholars, ascribes technology with omnipotence in shaping society. Soft determinism, meanwhile, locates the power of technology with respect to other social and cultural factors (Soderberg, 2013). Gunkel (2003) succinctly discusses the nuances between these two approaches to TD:

Since its introduction at the turn of the last century, TD has developed into two subsets generally called “hard” and “soft determinism.” Hard determinism makes technology the *sufficient* or *necessary* condition for social change, while soft determinism understands technology to be a key factor that *may facilitate* change. (p. 510)

Another key framing strategy in these reviews is the juxtaposition of TD with “social constructivism, which is in many ways its mirror image” (Hamilton and Heflin, 2011: 1052). This approach, according to Hrynyshyn (2008), is a natural consequence of the Internet’s emergence as a border-crossing technology that has evolved into a commercial communication platform. Conceptualizing the Internet this way, Hrynyshyn argues, has led to a subscription either to TD or the instrumental view of technology. He then posits that the social shaping of technology perspective serves as a viable approach through which the Internet can be theorized between the two extremes he has identified in the conceptualization of technology. Selwyn (2012), similar to Hrynyshyn, considers the paucities of both technological and social determinism as he supports social shaping of technology approach in dissecting the relationship between technology and, in his case, educational policy and practice.

Lehman-Wilzig and Cohen-Avigdor (2004), meanwhile, found their proposed model of media constructionism on the interaction between old and new media as it is informed by TD and social constructionism. Specifically, they argued that the

model relates to how much time it takes to diffuse cumulatively and adopt new media, as well as how many adopters exist at each stage. ... Thus, in our model each specific medium is both the subject of study and an important part of the objective social environment influencing the new medium’s development. (Lehman-Wilzig and Cohen-Avigdor, 2004: 708–709)

Such an attempt to bridge the apparent twain between technological and social determinism, while laudable, remains problematic for Hamilton and Heflin (2011) since it still conceptualized technology outside of society. Such an approach, they argued, meant that “much of the literature on convergence relied on TD or social constructivism while promoting two opposing views, a celebratory view based on cultural populism and a pessimistic view advocated by those we call progressive critics” (Hamilton and Heflin, 2011: 1051–1052). It does not address the challenge in locating technology within society and neither as product nor producer of social change. The need to refine determinism as a concept is echoed by Soderberg (2013: 1286) who asserted that “symmetry principle in constructivist science and technology studies” does little help in this regard. Schroeder and Ling (2013) further pointed to the limitations of constructivism as a reaction to TD in analyzing the relationship between technology and society. According to them,

Constructivist theory, although it provides case studies and analyses of various individual aspects of ICTs and social change, is limited by the fact that these are invariably bound to particular contexts or issues, which makes them difficult to evaluate across different cases or at a more general level. (Schroeder and Ling, 2013: 4)

Therefore, they offered the theorizing by Emile Durkheim and Max Weber on a structural approach as regards technology and social change.

## Framework

Recent reviews of the literature on TD have expounded on (1) the nuances of hard and soft TD and (2) the comparison and contrast between TD and other perspectives on the relationship between society and technology. However, as previous authors have argued, either approach has contributed little toward the conceptualization of determinism itself. This article thus addresses these new attempts in the understanding of TD by examining the ontology, or the nature of reality, within which TD assertions have been made. Moreover, it analyzes the purported effects—or, in other words, determinisms—of or on technology. In the process, it exemplifies that there is more to TD than the obverse of social constructionism.

To make sense of the renewed attention on TD, particularly with the many and diverse assertions about the relationship between society and interactive media, we use Burrell and Morgan’s framework in this article. We start by tracing the evolution of TD perspectives alongside the ferment between the subjective–objective dimensions, using assertions about the attributes of interactive media, particularly with respect to the possibilities of personalization which they offer. Moreover, the framework’s regulation and radical change dimension helps refine the nature of outcomes purported by determinism.

Burrell and Morgan first published the “Four paradigms for the analysis of social theory” in 1985 as a framework to organize grand and mid-range theories in the social sciences. In their conceptualization, the paradigms represent “contiguous but separate” (p. 13) quadrants across axes of regulation–radical change sociologies and subjective–objective dimensions. The framework at once categorizes social science theories and depicts paths through which these theories can move across categories. According to

Burrell and Morgan, the sociology of regulation emphasizes “underlying unity and cohesiveness,” while the sociology of radical change finds “explanations for the ... deep-seated structural conflict, modes of domination and structural contradiction” (p. 17) which characterize modern society. The subjective and objective dimensions, meanwhile, refer to the nature of science and the process of knowledge-making. These sociologies and dimensions then intersect in a quadrant.

According to Burrell and Morgan (1985),

The four paradigms taken together provide a map for negotiating the subject area, which offers a convenient means of identifying the basic similarities and differences between the work of various theorists and, in particular, the underlying frame of reference which they adopt ... It provides a tool for mapping intellectual journeys in social theory—one’s own and those of the theorists who have contributed to the subject area. (p. 24)

Using Burrell and Morgan’s framework helps sharpen the theorizing of determinism by understanding the objective–subjective relationship between technology and society which is at the crux of the debate between deterministic and constructivist approaches to technology. Subsequently, we frame this discussion using the order/regulation and conflict/radical change theories of technology and society vis-à-vis issues on culture, politics, and business. Similar to the previous discussion, the focus is on how interactive media facilitate or preclude order or chaos depending upon specific theoretical lenses. Finally, we align the theorists along Burrell and Morgan’s Four Paradigms to provide general, albeit fluid, typologies of TD across communication platforms. Specifically, in this meta-analysis of the literature, we endeavor to locate scholars and assertions according to the following typologies:

- The functionalists: TD at its core is premised on an objectivist view of reality in which definitions exist external to individuals.
- The radical structuralists: Technology serves as the infrastructure within which people interact with the caveat that its new and emergent forms are mutable and facilitates radical change in societal rituals and practices.
- The radical humanists: Despite the inherent positivism of TD, there are those who believe that individuals can subvert these predeterminations. By empowering individuals on their own and through the features of design interfaces, TD then becomes a subjective affair.
- The interpretivists: Similar to radical humanists, interpretivists see society’s relationship with technology as subjective. However, the focus of their discourse is not so much radical change but the understanding of social ordering.

This exercise surfaces the increasing dimensionality of TD with the emergence of interactive media and the diverse assertions about technological outcomes. By presenting these different typologies and continuums of TD, this article helps address previous concerns about the simplistic nature of its arguments. Moreover, this article presents the continuing discourse among scholars who seek to theorize new media as technologies which are mutable and within which personal and social interactions

change the content and nature of both user and medium. Where possible, we use direct quotations from the authors since the language that scholars use to phrase their arguments indicate, and inform us about, their theoretical lenses.

By organizing theories that touch upon TD, this article helps facilitate the discussion and scrutiny of such theorizing. At the macro-perspective, looking at TD using these typologies and the possible flows and permutations among them provide scholars with a menu for examining the relationship between technology and society that is much more nuanced than either technological or social determinism. It also addresses the undue bifurcation between these two dominant determinisms and arrays them as part of the rich theorizing about the intersections of society and technology. Researchers, particularly young scholars, can readily use the organizing framework to make sense of how they personally theorize such intersections.

## **New media in the objective–subjective dimensions**

### *The objective dimension*

Most noted among the technological determinists are Harold Innis and Marshall McLuhan. Innis looked at the macro-picture and argued that the arrangement of mass communication networks indicated a spatial bias that was skewed toward the New York–Washington corridor (Gladney, 1991; Haines, 2002; Innis, 1951). Innis felt that the new media (of his age) would not benefit humanity because of their hegemonic characteristic (Gladney, 1991).

McLuhan, a protégé of Innis, provided greater nuance to the role of technology in society as he essayed how technology or the medium of a message perhaps affected “individuals’ sense ratios and patterns of perceptions” (Rogers, 2000) and predetermined content itself. McLuhan’s own student, Neil Postman, argued for the presence of “technopoly” (p. 125) in which the ideology of technology superseded local mythologies (Gladney, 1991). Ontologically, across these three theorists, TD is rooted on objectivism, in which individuals are determined by a singular and external reality. This reality, in turn, is shaped by technology in its forms as ideology or superstructure. TD’s influence continues to inform various disciplines. Selwyn (2012: 83) noted the influence of TD in the use of media in education. He wrote, “a determinist way of thinking underpins the wealth of claims that video games *cause* violent behaviour, or that online tuition *enhances* learning.”

Borgmann (2000), referring to the seeming paradoxical loneliness in this interaction with new technologies, wrote

(computers) have extended and strengthened our grasp of reality. We seem more firmly in control of our means and ends. We can drive more safely and effortlessly, we can reach people easily, and we can call up information about the world more quickly ... Yet considered more closely, computers distance us from the world. (p. 194)

### *The subjective dimension*

Veak (2000), however, explained the idea behind the culture of technology reflected “the shortcomings of traditional theories of technology (as they) either characterize technology

as neutral or essentialize technology as some kind of autonomous, deterministic, and homogenizing force in society” (p. 226). Such critique and the emergence of subjectivism in the humanities and the social sciences have resulted in a review of TD. In the subjectivist perspective, people shape and construct reality, including technology. Feenberg (2000), for instance, merged constructivism, critical theory, and cultural studies to approach technology and argued that people can and must shape technology toward a common good. Indeed, theorists have considered micro-level interactions with new technologies which inform macro-level socio-political economy issues.

Wajcman (2010) offered a critique of TD using the literature on women and technology. She wrote, this literature

provided a compelling critique of TD, arguing that, far from being an autonomous force, technology itself is crucially affected by the antagonistic class relations of production. ... Extensive research demonstrated that women’s exclusion from technology was a consequence of the male domination of skilled trades that developed during the Industrial Revolution. (Wajcman, 2010: 147)

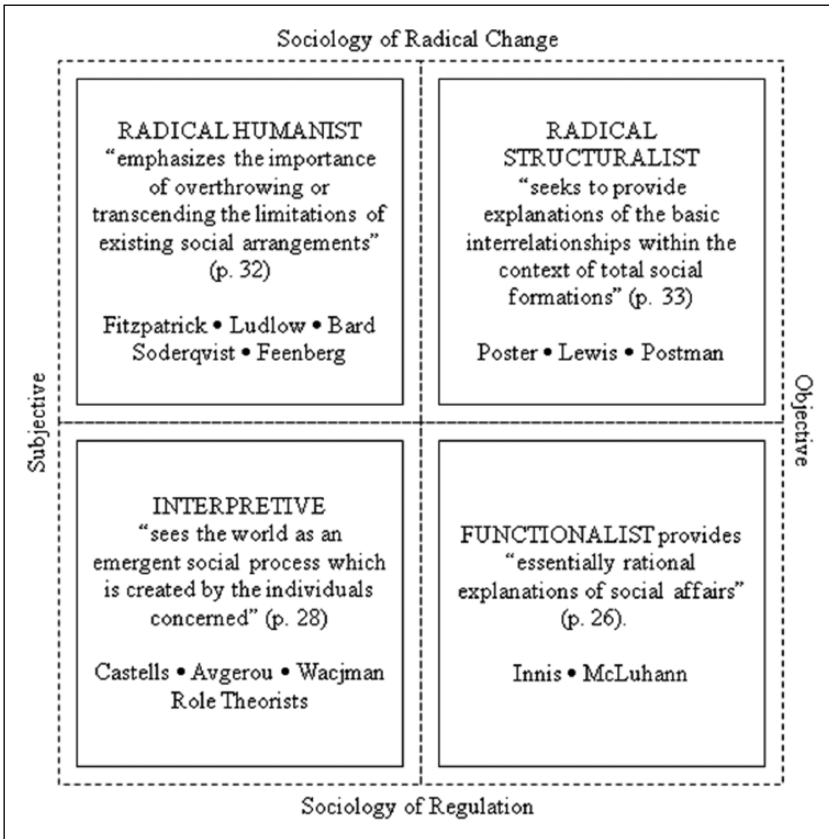
Schroeder and Ling (2013), meanwhile, used assertions by Durkheim and Weber to explicate “how a personal sphere, enveloped by access to information and by multiple mediated relations, sits comfortably within a larger sphere saturated by ICTs and complex and dense networks of relationships” (p. 15). Indeed, embedded in the objective–subjective dimension is the concept of “user/actor” that interacts with technology. This premise that individuals negotiate technology is in itself a critique of TD. Role theorists, for instance,

argue that we have no “self” as such. Our selves are merely masks we wear in response to the social situations in which we find ourselves. The Internet has offered up a new set of social situations, to which people have responded by grabbing a new set of masks. (Lewis, 2001: 15)

To array these assertions on TD on this objective–subjective, therefore, two categories emerge (see Figure 1): scholars such as Poster, Lewis, Postman, Innis, and McLuhan treat technology as objective determinants and scholars who consider subjective treatments of technology such as Fitzpatrick, Ludlow, Bard, and Soderqvist. However, to look at the conceptualization of the ontology of technology is only half of the TD argument. The other thesis, after all, of TD is the purported effect of technology, and the following section examines two sociologies with which this can be analyzed.

## **Regulation and radical change sociologies**

Burrell and Morgan (1985) discussed how dichotomous traditions in the social sciences conceived of society as either stable or changeable because of constant coordination or disintegration. Accordingly, arguments pertaining to TD and new media can be arrayed along these binaries, which Burrell and Morgan conceptualized as sociology of regulation and sociology of radical change. On the one side are those who believe in the normative/regulative power of technology on its users (O’Donnell and Henriksen, 2002). On the other side are those who subscribe to the power of technology in effecting radical change.



**Figure 1.** Technological determinism typologies using Burrell and Morgan’s (1985) four paradigms for the analysis of social theory.

Wright (2012), informed by Margolis and Resnick (2000), noted the importance of framing research according to a dichotomy between revolution and normalization, not unlike Burrell and Morgan’s conflict/order dimensions. Moreover, Wright allowed for points between these two opposites such as normalized revolutions, parallel to the continuum that the Burrell and Morgan framework conceptualizes. Wright said conceptual clarity can be achieved by looking at the macro- and micro-level consequences of a particular technology. Moreover, he cautioned that normalization was not to be equated with the status quo but the mainstreaming of new technologies into the current socio-political milieu.

*The sociology of regulation*

The increasingly inherent flexibility of text can perhaps be traced to the irony that new media such as the Internet were developed by free spirits working within what could be

considered as the prototype of regulation: the US Department of Defense (Simon, 2002). That the Internet, born of the desire to keep things in order, has come to be considered as a tool for change perhaps explains why its transformative power is almost always tempered with a sense of regulation. For instance, the Internet's ability to erode and cross borders "may also have created new barriers by making it possible for people to do business across borders if legislations are not harmonized" (Gattiker, 2001: 45). According to Hrynyshyn (2008), the structuring of domain names is another example of how the Internet has been appropriated by global capitalism and the nation-state.

Furthermore, it is argued that the Internet—despite its promise of revolutionizing society by promoting access to information, popular politics, and economic egalitarianism—has become another mass medium whose hierarchies resemble that of other institutions (Margolis and Resnick, 2000). Nilsson and Carlsson (2014) explained how politicians have appropriated the rhetoric of "new media as saviours of both representative democracy and the legitimacy of elected politicians" (p. 665) in Sweden.

In terms of praxis, some believe that the Internet has not been ultimately transformative since more information does not lead to better politics from the people (Margolis and Resnick, 2000). Bard and Soderqvist (2002) wrote that in an informational society, "at the bottom of this power pyramid we find the consumtariat trapped in the network of exploitative consumption where anyone can become a member" (p. 116).

Indeed, new political dynamics fostered by new media, as those espoused by the informants of Nilsson and Carlsson (2014), simply do not "take power away from the politicians and give it to the people" (Lewis, 2001: 204) leading to more direct and participatory politics. It means revitalizing citizen-based democracy as the monopoly of communications media by the political hierarchy is challenged. However, there is evidence that grassroots movements such as those fostered online are "either squashed by corporate capitalism or co-opted by the Washington bureaucratic machinery" (Veak, 2000: 234). Similarly, "when technology is professionalized or commandeered for an aim other than to fulfill our lives with purpose and virtues, when it is distorted into the domain of power, it destroys human capacity and thus is repressive and dehumanizing" (Heidegger, 1977 in Gladney, 1991: 102).

The research and development of the interface systems of Nokia mobile phones is a good case in design relative to the regulation-radical change continuum. This Finnish company consulted children on what they wanted from their mobile phones as they "came to each technology fresh, without preconceptions, and they picked it up more quickly" (Lewis, 2001: 17). Ironically, this research and development effort to innovate technology through client participation served ultimately to promote regulation. Once the new mobile phone interface was sold as a mass market commodity, it became tailored inasmuch as it contributed to "the broader context of the global market system" (Veak, 2000: 227).

Design thus serves as a metaphor for this development (Coyne, 1995). It highlights how interface design is "inherently political. Consequently, the observed constraint on design choice is not some 'essence' of technology but can be explained by the hegemonic control of the design process by privileged actors" (Veak, 2000: 226), in this case children who are tapped by a big business organization. In the case of the Internet, meanwhile, the dominance of web browsers and search engines has transformed it "into



a relatively passive medium than it is claimed to be by those who celebrate the Web as a spectacular breakthrough in interactivity” (Margolis and Resnick, 2000: 6). Moreover, it is also possible that technologies that communicate do not interface with us at all. Computers and websites, for example, could relay information about us without our knowledge in the same way that other technologies have invisibly insinuated themselves into our lives (Borgmann, 2000).

### *The sociology of radical change*

Other scholars, however, argue that new media have indeed resulted in radical change. Lewis (2001), for instance, noted “it is wildly disruptive to speed up information, and speeding up information was not the only thing the Internet had done” (p. 14). Moreover, beyond hastening the speed of information exchange, new media allow for greater “mobility” and “alterability” (Poster, 1995b), neither of which could have been done with legacy technologies such as television and radio. Thus, even while the Internet could be said as a mere convergence of functionally related technologies such as television, telephone, and radio it creates its scheme of determinisms. Merelman (2000) cited an interesting metaphor, “although driving a car and jogging on a treadmill are both forms of movement, they are very different ways of getting around. . . . Both technologies demand discipline, but the disciplines they teach are quite different from each other” (p. 170).

Feenberg (2000) further postulated “Modern technology is essential to their (capitalism and socialism) existence. Hence, any major change in technology raises fundamental questions of economic organization” (p. 242). By empowering smaller institutions, for instance, the World Wide Web can effect changes in authority and hierarchy. In doing so, the Internet can help facilitate democracy by being the center of new forms of economic wealth which it can also distribute (Margolis and Resnick, 2000). A good example in new media’s ability to unsettle the norms is the case of TiVo and Replay, which work within the television industry that they can actually undermine. In effect, “(this) illustrated the etiquette of the new dialogue between outsiders and insiders” (Lewis, 2001: 171–172). Ironically, even this “outsider” can eventually be the mainstream as TiVo and Replay boxes record “who watched what, when they watched, and even how they watched . . . The economic value of that knowledge is vast” (Lewis, 2001: 180). This process at once commodifies audiences (Smythe, 1981) and opens the potential for stronger audience control in the future (Borgmann, 2000).

Beyond business, there remains the experience of government in shaping policy in the context of new technologies. TD unsettles scholars because it can be perceived as anti-democratic, as Soderberg (2013) wrote,

Opposition to technological determinist thinking is shared by scholars from a wide range of academic traditions, from Marxist to constructivist. Underlying this shared rejection lies [sic] the concern that a technological determinist point of view is anti-democratic. This consensus might be misleading, though, since there is no agreement among scholars as to what constitutes TD. (p. 1285)

True, new media are widening the scope, visibility, and the socialization of conflict in governments (Brown, 2002) but they are also forcing governments to reinvent and

democratize political process (Simon, 2002). For instance “cryptography and related technologies ... may undermine the concentrations of power that we are currently familiar with, thus allowing us to take on substantially more individual responsibility” (Ludlow, 2001: vii). Poster (1995a) calls these individuals who have access to cyberspace as “electronic beings” and raises the questions about how electronic beings are to be governed given that power relations are being simultaneously nurtured by multiple media.

Still, despite these normative tendencies, “struggles against the arbitrary of technocratic power have been going on since the 1960s” (Feenberg, 2000: 241). Hackers vandalize and sometimes “use ‘denial of service’ attacks to bring down commercial or government sites. Many of these campaigns were carried out by amateur thrill-seekers, but others were sponsored by political groups, terrorists, and perhaps even governments” (Simon, 2002: 7). Another emergent trend in fomenting conflict against regulative information technologies is to attack them from within, similar to the activities of crypto-anarchists (Ludlow, 2001), netocratic groups and consumtarian rebels (Bard and Soderqvist, 2002). Along these lines, Fitzpatrick (2002) presented a theory of “cyber-criticalism” to discuss information and communication technologies (ICTs) and critical theories by arguing how the same otherwise benign instruments for surveillance that are used to maintain hierarchy could be subverted to resist that who operate them. Indeed, as Wright (2012) argues,

The revolutionary *potential* of technology does not lie in some innate quality that forces human beings to behave in a particular way. The revolutionary *potential* lies, instead, in how technologies are designed, exploited and adopted [or not] by humans in particular social and political contexts. (p. 247)

Furthermore, the Internet has blurred the boundaries of sources and audiences as message producers and receivers online could be one and the same in many aspects (Livingstone, 2003). Crucial in these arguments is the interface design inherent in technology. Kawamoto (2003) asserted that websites can become interactive and conversational rather than simply informational, anticipating the emergence of social media.

This transition in TD across communication platforms is, in fact, a recurring theme in the literature. Woodward (2003) wrote, “modernist designs for technologized communications have transformed contemporary cities and, arguably, now determine their character.” In today’s society, Borgmann (2000) explained, “these instances of how computers have invaded our lives ... represent something of the effect of cyberspace has had on identity and character” (p. 194).

While technopoly (Poster, 1995b) implied the perpetuation of stratifications in technologized communities (Woodward, 2003), Feenberg (1999) argued that technology

can also be used to undermine the existing social hierarchy or to force it to meet needs it has ignored. This principle explains the technical initiatives that often accompany the structural reforms pursued by union, environmental and other social movements. (p. 79)

Feenberg (2009) revisited his argument in a special issue of the Information Society journal and stated that “Just as the Internet is unfinished, so is the response to its

transformative effects on our society” (p. 83). Poster (1995b: para 12) likewise said that technologies could result in both regulation and radical change:

Still, in the “worst” cases, one must admit that the mere fact of communicating under the conditions of the new technology does not cancel the marks of power relations constituted under the conditions of face-to-face, print, and electronic modes of intercourse. Nonetheless, the structural conditions of communicating in Internet communities do introduce resistances to and breaks with these gender determinations.

By adding the layer of sociologies, it is possible to qualify differences between scholars who work within similar ontologies of technology. Doing this now surfaces four paradigms of determinists:

- The functionalists such as Innis and McLuhan who believe in the regulative power of media.
- The radical structuralists such as Postman and Poster who believe in a mutable technological infrastructure within which people interact so as to effect radical change.
- The radical humanists such as Fitzpatrick, Ludlow, and Bard and Soderqvist who consciously fight the determinisms of technology as they strive for radical change.
- The interpretivists such as those who support the social constructionist of technology as they believe in human agency in the use of technology, particularly toward social ordering.

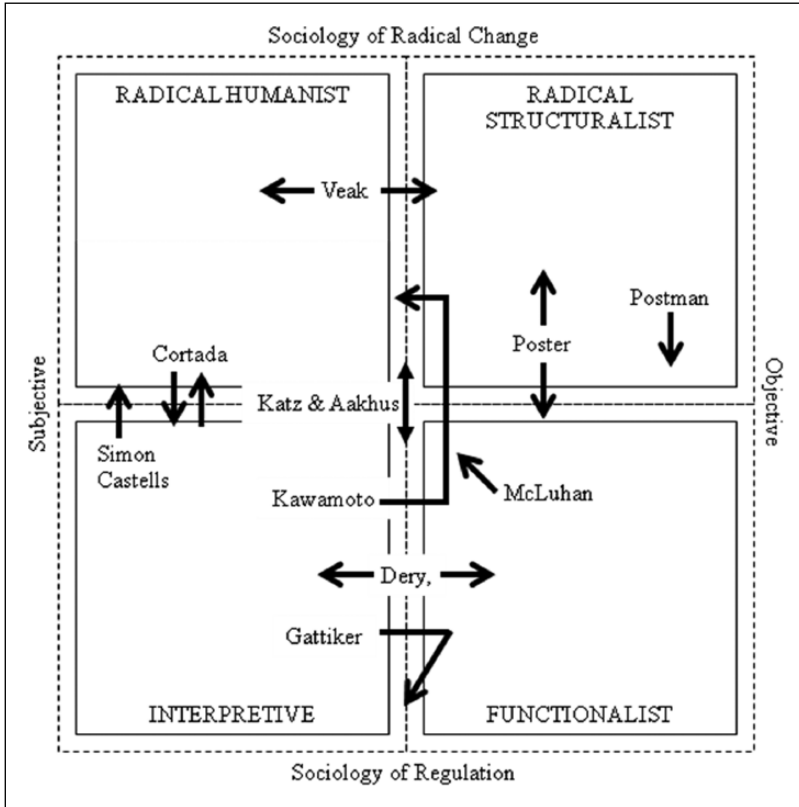
## **Intersections between dimensions and sociologies**

It is important to note, however, that these classifications are not definitive, as Burrell and Morgan also argued in their framework. Instead, different readings of theories reveal various nuances which can argue that specific theorists and theoretical arguments straddle categories or eventually move from one category to another (see Figure 2).

### *Straddling change and regulation*

There may be a tendency to create a dichotomous pairing of objective-regulation and subjective-radical change because of the dominant understanding of TD in which technology, as an external force, is understood to reinforce established hierarchies in society. Conversely, arguing that technology is controllable connotes a sense of empowerment that implicitly results in change. However, as Figure 1 depicts, there are scholars who treat technology objectively yet believe it can be a tool for change just as there are scholars who conceptualize it subjectively but maintain it is a tool for regulation. More importantly, however, as Figure 2 depicts, theorists’ arguments also straddle the four typologies in the paradigm.

Re-readings of McLuhan have argued that his approach to technology is actually inter-subjective rather than objectivist (Grosswiler, 1999; Havers, 2003). Moreover, while Innis and McLuhan are often presented together as hard determinists because of



**Figure 2.** Continuums of determinism.

the linearity of their assertions, they arguably differ on their intended consequences. Innis believed technology was inherently regulative whereas McLuhan believed technology can result in significant social reconfigurations. In this regard, Postman is more aligned with Innis and less with McLuhan in their descriptive, rather than prescriptive, approach to TD and change. Postman, moreover, ultimately argued that technology as structure helped societal regulation.

Accordingly, even if the Internet provides opposition groups in authoritarian societies with a new technology in their communication arsenal (Margolis and Resnick, 2000), authoritarian regimes continue to stop or limit the use of the Internet or some of its features among their people, precluding the opposition to truly harness the new medium’s transformative potential (Simon, 2002). Historically, governments have enacted policies to control media. This continues even if the exponential growth of technology makes the task more difficult (Gattiker, 2001), but not impossible in the long term (Cortada, 2001).

Among the arguments of TD is the ability of technology to compress time and space. In other words, all technologies automatically effect change, the intensity of which has to be qualified. Burrell and Morgan accordingly distinguished theories according to how

radically they see a change in society. However, what can be envisioned as radical change? The theorizing about technology and change has focused not so much on major shifts in society, but on the series of seemingly innocuous but incessant changes in the relationship between society and technology that perhaps ultimately result in radical change.

Castells (1996) wrote that while technology was powerful, its relations with individuals were “matters of inquiry rather than of fate” (p. 76). Indeed, social constructionists have asserted that users have shaped technologies and that “the capacity and effects of technology introduced at the workplace are a matter of interpretation by human actors according to their social conditions” (Avgerou, 2002: 60). Arguably aligned with this thinking is the concept of “Apparatgeist” (Katz and Aakhus, 2002)

which captures the range of possible behaviors vis-a-vis a particular technology. However, as Katz and Aakhus explained, Apparatgeist does not imply ‘TD’ in a strong sense, since technology does not determine what the individual user can do with that technology. (Axelsson, 2010: 50)

Apparatgeist, as Campbell (2007) summarized, “draws attention to both the meanings that people construct for technologies and their social consequences” (p. 345).

### *Blurring the distinction between the objective and the subjective*

This article shows the utility of Burrell and Morgan’s framework to frame TD. In the intervening decades since they constructed the framework, however, the discussion of, and the practical implications about, their two axes has become quite complex, particularly because of technological innovation. From a technological perspective, for instance, the objective–subjective dimension to discuss the ontology of society and technology is not as clear-cut as in 1985. With legacy media such as newspapers, radio, and television, there was a distinct difference between the medium and its user as they relate within a reality that is both external to them. With new technologies such as the Internet, however, social networks can be embedded within the technology itself. This calls for a redefinition of what constitutes an objective reality. In Internet spaces where social networks are formed, for instance, the objective setting is the technology itself. In such a space, people can be said to interact with two objective realities: the reality with which they still remain as entities distinct from technology and the reality in which they have been subsumed within the technology.

The structuralist approach argues that “technology provided the opportunity for people to manipulate machines to expand human control over nature” (Merelman, 2000: 168). Other theorists espouse this idea of a reflexive relationship between the individuals’ use of technologies and how this use, in turn, can determine the user. Lewis (2001) said, “The technology of the Internet was far less interesting than the effects people were allowing it to have on their lives, and what these, in turn, said about those lives” (pp. 14–15). Gattiker (2001: 185) wrote, “It is not so much the technology as the way we use technology that will shape our information future.” Kawamoto (2003) echoed this line of argument:

The technology in and of itself will not make any difference in creating increased civic engagement, but the application of the technology by those who believe it can be a tool for more democratic communication and action is what holds promise. (p. 101)

Avgerou (2002) identified structuration, “the interplay between technology and human action” (p. 55) as one of two general categories of theories in communication technologies, the other being the assumption of a causal relationship between technology and society.

The inability of otherwise pioneering technology theorists such as Martin Heidegger and Jacques Ellul to understand this nuance has been considered as their main failing. It is argued that today society and technology reflexively determine each other (Gattiker, 2001). As Poster (1995a) explained, new media as we know them, transforms the materiality of mediated text; the hypertextuality of messages has rendered it easily accessible to infinite reformatting or reconfiguration. This hypertextuality concept can be linked to the social constructionist argument which asserts that

technology continues to be shaped and reconfigured beyond its design ... Designers do not have adequate knowledge of the ‘user’, and they leave loose ends at the boundary between the machine and its user that take shape during trials and implementations. (Avgerou, 2002: 60)

One such example is found in Veak’s (2000) summary of how Feenberg’s suggestion of a

“radical democratic politics of technology” can thwart this hegemony and open up space to reshape modernity from within. The design choice process must be liberated by what he calls “democratic rationalization” in which subjugated actors intervene in the technological design process to shape it towards their ends. (p. 226)

Taken to the extreme, however, actors who work with technology can be seen as transforming “into cyborgian hybrids of technology and biology through our ever-more-frequent interaction with machines, or with one another through technological interfaces” (Dery, 1994: 6). This cyborgian concept, however, is simply one of many utopian visions for the Internet. Ludlow (2001) wrote, “perhaps the Internet provides the opportunity for utopias to emerge, in various remote corners of cyberspace—in various ‘islands in the Net’, to borrow a phrase from Bruce Sterling” (xvii). But before such utopia takes place, a sense of regulation is called for: “to make the Internet a safe and productive place for users around the world, a better understanding about possible differences in moral reasoning across countries would be beneficial” (Gattiker, 2001: 121). Whether such normative perspective is consonant with the dynamics of Internet, however, is contentious. After all, the Internet, by crossing barriers, enables people from different places to interact freely, perhaps educating them of each other’s cultures and circumstances (Simon, 2002: 8–14). Haddon (2000), for his part, noted that actors could also subvert technology simply by excluding themselves from the digital community. Lewis (2001), meanwhile, explained how “The Internet had made it possible for people to thwart all sorts of rules and conventions” (p. 14) with the changes in stereotypical roles of children, parents, and big business, among others.

## Conclusion and implications

This article revisits TD in the light of new media and the attendant theorizing about the relationship between technology and society. Using Burrell and Morgan's organizing framework, the article organizes such theorizing along two axes. First, it explores how theorizing as regards TD can be arrayed along the dimension between objective ontology and subjective ontology. Second, it examines how such theorizing treats or predicts social relations with respect to the interface between technology and society—whether the interface results in regulation (the maintenance of the status quo) or in radical change (the overhaul of present systems).

### *Addressing the ambivalence with determinism*

The resulting framework in this exercise provides a system of classification for scholars who wrestle with the supposed dichotomy between technological and social determinisms. That dichotomy, as the framework shows, is simplistic; instead, it is part of a continuum of perspectives through which one can approach the relationship between new media and society. However, in the literature reviews analyzed in this article, authors invariably sound as if they were apologetic about mentioning, or seeming to subscribe to, TD. Barnett (2006) wrote,

In contemporary philosophy, the charge of TD has a stigma attached to it, and is often used to end an argument. I certainly do not mean it in the dismissive sense here. As I see it, the opposite perspective, the “social shaping of technology,” is similarly problematic. (p. 520)

Selwyn (2012) acknowledged the limitations of TD to explain that “it is perhaps not surprising that there has long been considerable unease within the social sciences over the descriptive limitations of such strong determinist analyses” (p. 84).

Accordingly, authors ensured their work on technology and society could not be construed with TD. Das and Pavlickova (2014) said,

The worry over the many prefixes of literacies—cyber, digital, media, new media, techno, information, multi and so on—is rooted in a worry over TD. Scholars express discomfort that these prefixes may not ultimately make much sense, and that the conversation may be hijacked over to technologies [or texts] alone. (p. 393)

Meanwhile, Klinger and Svensson (2014) explain that using “the theory of media logics allows us to address this non-neutrality without resorting to either TD or normalization” (p. 2). Similarly, Bendrath and Mueller (2011) said their framework for technology-aware policy analysis avoids “the extremes of TD and social constructivism” (p. 1142). Anderson (2013) evoked this ambivalence with which scholars approach TD:

To conclude, I want to advance the notion of technology as an independent lens of analysis without advocating, I hope, a pernicious form of TD. For most sociology, an over-emphasis on the role played by technology in the construction of news constitutes the primary sin, one to be assiduously avoided. But is there a way to talk about technology and the news on its own terms,

without reducing said technology to either a political, economic, cultural, or social construction? I would argue that, to a limited degree, there is. (p. 1016)

This article hopefully addresses the concerns of Anderson and other scholars who deal with the shades and stigma of TD. The complexity of the theorizing and application of TD and corollary perspectives on society and technology means scholars need not be apologetic about TD. This ambivalent stance among scholars seems contradictory to continuing subscription to TD among the public and politicians. Soderberg (2013) notes, “scholars of all hues have thus lined up behind a critique of TD. Despite these sustained attacks, technological determinist explanations remain as compelling as ever to the general public.” Nilsson and Carlsson (2014) echo this sentiment as it applies to politicians:

People are assumed to have too much faith in the technology itself. This ‘cyber-optimism’ has been described as TD among politicians and decision makers, as they seem to equate the availability of information and communication technology with social, political and economic development. (pp. 656–657)

There is a need, therefore, for scholars to confront TD in its complexity so that they defend or critic it completely as intellectuals who can inform the public and the politicians who perhaps subscribe to simplistic notions of TD. Moreover, the ontological foundations of classic TD indicate its theoretical value even with the well-established critique about its ahistoricity and reductionism.

### *Future directions*

This article, in its attempt to frame TD, looked at papers that primarily discuss the Internet and its relationship to society. A parallel body of literature on mobile communication can also be explored as regards their arguments about the relationship between technology and society. The case of mobile communication is distinguished from the Internet because of the greater ubiquity of mobile phones in everyday life and the incessant nature of their use. As such, the literature on mobile communication can enrich the typologies presented in this article. Apparatchgeist (Katz and Aakhus, 2002) is but one concept on mobile telephony that touches TD.

Moreover, this article only looks at the ontological layer of the literature on TD. A subsequent project can look at the other criteria such as epistemology (methods) and axiology (values) that Burrell and Morgan (1985) used to categorize theories. Admittedly, our discussion of social constructionism has been limited to how literature has used it as a foil for TD even as our own effort focused on differentiating between the objective–subjective ontology of technology and society. By exploring epistemology, subsequent efforts can expound on other approaches to social constructionism from a critical discourse perspective, among others.

Future efforts can also use Burrell and Morgan’s framework to organize theories that have been enriched and expanded from their original foundation. For example, the literature on gatekeeping has grown significantly in recent years to discuss various media, situations, and stakeholders (Barzilai-Nahon, 2008). In particular, the discussion



now includes both gatekeeper and the gated, shifting the discussion from the previous unilinear gatekeeping approach and facilitating the creation of typologies according to objective–subjective dimensions. More critical approaches to gatekeeping, meanwhile, enable the discussion of the theory along regulation and radical change sociologies. Similarly, Uses and Gratifications Theory can now be approached from two perspectives. The first approach looks at users as active who identify specific media to fulfill some needs. The second approach, meanwhile, looks at how the media predetermines how people use them for particular gratifications.

These theories, among others, have been used extensively in the literature, with each paper informing and contributing to their arguments. Burrell and Morgan's framework can help organize these contributions and surface nuances and gaps in future efforts to extend the original theories.

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### Author biographies

Fernando de la Cruz Paragas (PhD, Ohio University) is a faculty member of the Department of Communication Research of the College of Mass Communication at the University of the Philippines Diliman. His research focuses on the intersections among mediated communication, international migration, and message design. His current research dwells on the antecedents of mediated learning. He earned his PhD as a Fulbright scholar.

Trisha TC Lin (PhD, University of Hawaii, Manoa) is an assistant professor of the Wee Kim Wee School of Communication and Information in Nanyang Technological University, Singapore. She used to be a media professional in the broadcasting industry. Her research interests include new media convergent, adoption, and impact, mobile media and communication, innovation television, and digital journalism. She has publications regarding socio-technical analysis and user study of mobile media in Asia (e.g. mobile television, location-based advertising, and mobile instant message), innovative audiovisual and journalism technologies (e.g. multi-screen television and integrated newsrooms), and digital dependency (e.g. smartphone dependency).