TOWARD AN ACCESSIBLE CONCEPTION OF CYBERSPACE

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INTRODUCTION

At a fundamental level, cyberspace differs from the physical world of corporeal social interaction; it has its own "space-time" that intersects with, but is not the same as, the Einsteinian space-time of the physical world.[1] For Internet users, the intersection between the physical and cyberspatial worlds is mediated by interfaces that transform bit streams into intelligible presentation, and vice-versa. Because so many interactions in cyberspace occur through these interfaces, which are often designed to mimic familiar experiences in the physical world, the differences between the physical and cyberspatial worlds typically go unnoticed: unlike the character Neo in the *Matrix* films, users see the computer screen, and not the underlying code.[2] Most people accordingly cannot call to mind a particularly clear conception of cyberspace: apart from its user interfaces, they do not know how it works and probably could not describe it with any degree of certainty.

This Article addresses the effect of such conceptual misunderstanding on discussions about the nature of "the good" in respect to cyberspace. By the good, we have in mind, at a minimum, a general societal consensus on the way in which life should be ordered.[3] Individuals in groups, cultures

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This article is a substantially revised version of a paper originally presented by the authors at the Fifth International Conference on Computer Ethics—Philosophical Enquiry, held at Boston College, June 25-27, 2003. The authors thank the participants at that conference for their many thoughtful comments and suggestions. They are also grateful to Shaun Spencer, Jith Meganathan, Randy Bird, and John Myers for their comments, and to Alexandra Deal for superior research assistance. The authors of course bear responsibility for any errors that remain.

1. Note that we use the term "physical world" as a placeholder to indicate the "real" world in which we all exist; though people might disagree as to how to define the physical world, it suffices to say that the physical world is the corporeal world in which we all live when our attention is not occupied by surfing through cyberspace—that is to say, for most of us, the world in which we spend our days. *See* Ann Bartow, *Electrifying Copyright Norms and Making Cyberspace More Like a Book*, 48 VILL. L. REV. 13, 18 (2003) (referring to the physical world as "real space").

2. THE MATRIX REVOLUTIONS (Warner Studios 2003); THE MATRIX RELOADED (Warner Studios 2003); THE MATRIX (Warner Studios 1999).

3. Deeper questions about the nature of "the good" as applied in (or to) cyberspace can and should be the subject of further philosophical inquiry. A rich analysis could be done, for example, on the relationship of Plato's concept of the good to a socially constructed notion of the good in cyberspace,

and communities come to define the good through social interaction and historical processes that concern commonly understood artifacts. One of the reasons why discussion about the good can occur at all is because of shared social constructions. Environmental and anthropological cues, interpreted through adopted socialized frameworks, contribute to common understandings about the meaning of information. As Peter Berger and Thomas Luckmann put it in their classic work, *The Social Construction of Reality*, "we share a common sense about [the physical world's] reality."[4] Fierce disagreements will often arise within a society or culture about what, specifically, comprises the good in various areas of life, including government, commerce, family and religion. But such discourse is wide-ranging and productive, even when frustrating, because it occurs within a social framework containing reference points that are conceptually familiar to its participants.[5]

Conceptual misunderstanding about cyberspace tends to hinder productive discourse about the ways in which public management of the Internet, if any, should be structured.[6] Given the speed at which the Internet is developing, and the extent to which its influence defies traditional

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particularly in relation to governance of the Internet. On Plato's concept of the good as it relates to authority and governance, see JEAN HAMPTON, POLITICAL PHILOSOPHY 23–25 (1997).

4. PETER L. BERGER & THOMAS LUCKMANN, THE SOCIAL CONSTRUCTION OF REALITY: A TREATISE IN THE SOCIOLOGY OF KNOWLEDGE 23 (1966).

5. Consider, for example, the debate in the legal academy over whether legal regimes of either legislative or judicial origin should be concerned foundationally with individual well-being as the primary social good. *See, e.g.*, LOUIS KAPLOW & STEVEN SHAVELL, FAIRNESS VERSUS WELFARE 465 (2002) (arguing that legal rules should be based exclusively on considerations of individuals' well-being). More pointedly, consider the recent discussion in a California state case, in which the plaintiff argued that unsolicited e-mails constituted trespass, over whether the Internet space used by the plaintiff should be deemed personal or real property. Intel Corp. v. Hamidi, 71 P.3d 296, 299–300 (Cal. 2003) (holding that defendant's "electronic email does not constitute an actionable trespass to personal property").

6. Notwithstanding any technical distinctions between them, we use the terms "cyberspace" and "Internet" interchangeably as referring to the virtual space created by "the (potential) interconnection between any of millions of computers located around the world." A. Michael Froomkin, *Habermas@Discourse.net: Toward a Critical Theory of Cyberspace*, 116 HARV. L. REV. 749, 778 (2003); *see also* Alfred C. Yen, *Western Frontier or Feudal Society?: Metaphors and Perceptions of Cyberspace*, 17 BERKELEY TECH. L.J. 1207, 1214 (2002) (describing cyberspace as "the virtual space created by operation of the Internet, a network of computers that share information with each other"). As we use the terms, cyberspace and the Internet are also synonymous with the "Web." *See* DAVID WEINBERGER, SMALL PIECES LOOSELY JOINED: {*A UNIFIED THEORY OF THE WEB*} 8 n.* (2002) (noting the technical and historical differences between the Internet and the Web and that such differences go unnoticed "in the public consciousness").

territorial and legal boundaries,[7] it seems unlikely that a coherent and comprehensive set of widely accepted international norms will evolve on their own, absent, at a minimum, public discussion about how the Internet ought to be managed, if at all. While some emerging cyberspatial norms—like those involving ownership of property in cyberspace—may endure for a time,[8] the question of whether some kind of organization and regulation in cyberspace is necessary still looms, propelled by external forces, such as market influences, government intervention, and the actions of private citizens, each of which may involve an attempt to graft rules of the physical world onto cyberspace.[9]

In our view, such ad-hoc, transpositional management is not the best way to organize and regulate cyberspace. But it is the default, absent a conception of cyberspace that looks behind the veil of the user and allows individuals to appreciate that the mechanical rules of cyberspace differ from the rules of the physical world, and that cyberspace is, in many ways, a socially-constructed reality.[10] Such an appreciation can be used to elaborate a conception of cyberspace that could be the basis for reasoned opinions about how, precisely, cyberspace should be organized and regulated. For if we—the individuals who comprise the global community—are going to engage in discourse about how cyberspace should be managed—whether by governments, market actors, or computer code makers—some conception of cyberspace must be articulated that makes it accessible to all reasonably intelligent persons, so that they can make informed, deliberate decisions about proposals for its organization and regulation.[11]

This Article represents a preliminary effort to consider ways in which individuals might conceptualize cyberspace apart from artificial, masking interfaces. We begin by sketching differences between cyberspace and the physical world. We discuss the mechanical rules of cyberspace and the ways in which cyberspace may be incompletely understood by those who

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7. As Lawrence Lessig observed nearly a decade ago, Internet technology allows people to "meet, and talk, and live in cyberspace in ways not possible in real space." Lawrence Lessig, *The Path of Cyberlaw*, 104 YALE L.J. 1743, 1746 (1995).

8. *See infra* notes 50–56 and accompanying text (discussing emerging cyberspatial property norms).

9. *See, e.g.*, eBay v. Bidder's Edge, Inc., 100 F. Supp. 2d 1058, 1069 (N.D. Cal. 2000) (applying the law of trespass in the physical world to allegations of trespass in cyberspace); *Intel Corp.*, 71 P.3d at 299–300 (Cal. 2003) (holding that defendant's "electronic email does not constitute an actionable trespass to personal property").

10. *See* BERGER & LUCKMANN, *supra* note 4, at 172–73.

11. Some kind of shared social framework is necessary to approach technical problems as well as moral and political issues; to resolve those issues, informed individuals must agree on such matters as agendas, processes, tools, languages, etc.

bring to it only their conception of how life works in the physical world. Relying upon Berger and Luckmann's pathbreaking work, we suggest that the user interfaces that mediate between a perception of the physical world and an understanding of cyberspace as an entity, are based in socially constructed realities.[12] We next discuss the ways in which behaviors in cyberspace may herald the development of particular cyberspatial norms. We argue that, notwithstanding the development of such norms, efforts should be made to articulate a conceptual model of cyberspace that respects its unique attributes—one that is accessible both to the actors who will take the lead in organizing and regulating cyberspace, and, perhaps more importantly, the citizens of the world who will hold those actors accountable.

I. THE STATUS OF CYBERSPACE

It has been suggested that the time has come for us to stop capitalizing the word Internet. Joseph Turow, a professor at the Annenberg School for Communication at the University of Pennsylvania, argues that, by using the lowercase "i," we would signal that the Internet is simply a "part of the neural universe of life," like "air [or] water."[13] "I think the moment is right," Turow maintains, to refer to the Internet "the way we refer to television, radio and the telephone."[14]

To view the Internet in the same way as communication technologies like television or telephony seems a small thing; the Internet has become a ubiquitous feature in the lives of many individuals across the globe, and it is not going away. But to view the Internet in the same way as televisions and telephones in daily parlance is to endorse the notion that these media share more than ubiquity; it implies that we have also accepted the Internet and the availability of cyberspace in our lives, just as we have accepted televisions and telephones, and, therefore, that we have some conceptual grasp—however limited—of this new technology, this digital realm. In other words, it suggests that we have accepted that cyberspace is not a wholly alien concept. It also suggests that we share the conceptual tools necessary to engage in productive discourse about what should—and should not—be done with cyberspace in terms of public management.

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12. BERGER & LUCKMANN, *supra* note 4, 172–73.

13. John Schwartz, *Who Owns the Internet? You and I Do*, N.Y. TIMES, Dec. 29, 2002, § 4 (Week in Review), at 3 (quoting Joseph Turow, Professor at the Annenberg School for Communication at the University of Pennsylvania).

14. *Id.*

But are most of us—even those who venture into cyberspace every day—able to conceptualize cyberspace in a way that accounts for the signal differences between the reality of cyberspace and the reality of the physical world? To illustrate, consider the difference between ordering merchandise from a person versus ordering on-line. When a consumer buys something from a printed catalog, she places a call to an agent, who will take down the details. When the transaction is complete, the consumer hangs up. This transaction via telephone may be described as a synchronous communication between two individuals.[15]

Now, consider the same transaction accomplished via the Internet. The consumer will visit the catalog website and manually input the details that would have been orally communicated to the agent, and then will "click" a button to complete the transaction. The consumer will likely view these two methods of shopping as similar, if not identical, because the catalog website (the user interface) has been specifically designed to create the illusion of familiarity—a cross between flipping through the hard copy of the catalog she received in the mail and "speaking," albeit via data entry, with a customer service agent.

Yet, the two transactions are actually quite different. First, the Internet transaction is not synchronous.[16] Data is "communicated" only insofar as it is stored.[17] This storage is bi-directional: information—meta-data—invisible to the consumer was sent to her computer as cookies and HTML code—and there it resides even after the transaction's nominal conclusion.[18] When the consumer again visits that catalog website, the new communication is, in a sense, an extension of the old. Any new visits or

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15. *See* William P. Matthews, *Encoded Confidences: Electronic Mail, the Internet, and the Attorney-Client Privilege*, 45 U. KAN. L. REV. 273, 293 (1996) ("Unlike electronic mail, . . . cordless and cellular phone transmissions are synchronous forms of communication—the sender and the recipient transmit and receive simultaneously.").

16. *See id.*

17. *See* Tatsuya Akamine, Note, *Proposal for a Fair Statutory Interpretation: E-Mail Stored in a Service Provider Computer is Subject to an Interception Under the Federal Wiretap Act*, 7 J.L. & POL'Y 519, 561 (1999) (explaining that "'[e]lectronic storage' is a part of the entire communication process").

18. HTML is Hypertext Markup Language, the baseline code behind all web pages that enables the creation of the World Wide Web via accessible Internet addresses. Matthew J. Feeley, Note, *EU Internet Regulation Policy: The Rise of Self-Regulation*, 22 B.C. INT'L & COMP. L. REV. 159, 161–62 (1999). *See* Reno v. Am. Civil Liberties Union, 521 U.S. 844, 852–53 (1997) (discussing communication and navigation in cyberspace). Cookies are small segments of identifying code placed on the user's hard drive by the browser based on instructions from the web site. *See* David Wille, *Personal Jurisdiction and the Internet–Proposed Limits on State Jurisdiction over Data Communications in Tort Cases*, 87 KY. L.J. 95, 198 (1998-99) (describing cookies and discussing the dangers they pose).

transactions become part of a larger communication that cannot be terminated simply by ending the phone call. Second, the Internet transaction does not really represent a communication between people, for our hypothetical consumer was not "talking" with anyone, even via e-mail; she was instead inputting information in response to the algorithmic prompts of the catalog website.[19] The first human response occurs when a warehouse worker pulls merchandise based on a packing list and prepares it to be shipped to the purchaser.

Thus, notwithstanding the experiential similarities between the two transactions from the consumer's perspective, they are quite distinct as a technological matter. In on-line transactions, there is no mutual, simultaneous understanding of information. Unlike face-to-face and telephonic communication, interaction in cyberspace is mediated by an interface designed to mask the technological complexities and capabilities of the medium, for the way cyberspace works at the algorithmic level of bit management is fundamentally different than what may be apparent to the end-user.[20]

We are less interested here in examining *why* cyberspace interfaces exist than in exploring what they may prevent individuals from doing—namely, conceptualizing a reality—cyberspace—that is, in many respects, quite different from the reality of the physical world. We venture that, if larger questions about how cyberspace is to be organized and regulated are to be addressed fully, attention must be paid to making cyberspace accessible conceptually for as many individuals as possible, and not just for those who seek to control it. Some kind of common rubric is needed to accomplish this goal.

II. THE CYBERSPATIAL WORLD VERSUS THE PHYSICAL WORLD

As illustrated in the previous section, a mask—the user interface—mediates excursions into cyberspace for most individuals in respect to a

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19. The goal is data capture, and the experience of communicating via a website interface belies the ways in which data is transmitted and stored in cyberspace. *See* Leslie A. Kurtz, *The Invisible Becomes Manifest: Information Privacy in a Digital Age*, 38 WASHBURN L.J. 151, 153 (1998) (describing how data is routed, captured, and stored as online communication).

20. There are many reasons why this should be so, not least of which is because ease of use and pragmatism require that websites and software operate in a way that effectively masks an underlying and unintelligible array of 0s and 1s, the binary language of computer code. *See, e.g.*, Griffin S. Dunham, Note, *Carnivore, The FBI's E-mail Surveillance System: Devouring Criminals, Not Privacy*, 54 FED. COMM. L.J. 543, 556 (2002) (discussing the packet switching process of dividing information before it is sent and then organizing the binary code "into a readable message" at the destination).

variety of cyberspatial activities, from consumer transactions to communication via e-mail. Though the user interface enables access to the Internet, it also effectively prevents individual users from acquiring a genuine understanding of what lies behind it. This is problematic, for the Internet, as both a technical matter and a conceptual matter, is different in kind from other modern communication technologies: cyberspace, as David Weinberger has observed, "has no geography, no landscape. It has no distance. It has nothing natural in it."[21] Unlike telephony, thoughtful use of the Internet requires more than interaction through an interface; it requires some effort at interpretation, at translation of text and images into an intelligible understanding of what they may represent, and what actions they may trigger.

If mere use of the Internet requires interpretation, it follows that thinking about an appropriate management scheme—even whether comprehensive management is appropriate—may also require interpretation. A regulatory structure for cyberspace—whether imposed through government intervention, market forces or computer code—will not necessarily mirror the regulatory structures imposed on other modern technologies. For example, while we can use and, to a lesser degree, regulate automobiles without conceptually understanding how they function, cars are relatively comprehensible machines. We do not, after all, exist in a space defined by cars; rather, cars exist in a space defined by the mechanical rules of the physical world.[22] Cars, moreover, are a mode of transportation, and not a space—or a place—that may contain multiple kinds of social interaction on a larger scale.

As tools for transportation, cars are relatively simple. We control the motion of the car with the steering wheel and the attendant mechanical devices a driver finds at hand—that is, through the car's user interface. The interface is connected to the moving parts of the car's engine, and though those moving parts remain hidden beneath the hood, the cause and effect relationship between the controls and the engine, and between the car and the road (and, for that matter, the driver and other drivers) are based on

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21. WEINBERGER, *supra* note 6, at 8–9.

22. And even with cars, regulators must understand issues such as internal combustion versus electrical motors, hybrid options, natural gas power, miles per gallon, vehicle weight, and so on. Such issues are central to current debates over automobile fuel efficiency standards. *See* Karen D. Bettencourt, *California's Attempt to Remain the Leader in Environmental Policy: Regulating Carbon Dioxide Emissions from Vehicles Sold in the Golden State*, 34 MCGEORGE L. REV. 465 (2003) (describing the effect of California law enacted to regulate greenhouse gas emissions from cars). *See also* ARNOLD W. REITZE JR., AIR POLLUTION CONTROL LAW: COMPLIANCE & ENFORCEMENT 278–96 (2001) (detailing the complexity of regulating cars and the fuels used by cars).

common understandings of the mechanical rules of the physical world and the consequences of actions according to those mechanical rules.[23] In this sense, the user interface for the car is essentially transparent—it is a mask, to be sure, but one designed almost exclusively to ease control over the tool. It is not hiding behind it a different set of rules that may or may not affect the car's operation during the course of a drive; neither is it camouflaging access to a communications medium; neither is it an arena in which social interaction is expected to take place. Accordingly, we may regard the driver's control over the automobile via the interface as authentic and complete—the interface is not masking a hidden automobile architecture that may operate contrary to the mechanical rules of the physical world, or that may be used as a platform for wide scale social interaction.[24]

The relationship between an individual user and common cyberspatial interfaces is different. That interface is an artifact that masks both the way in which the Internet operates, and the potentially unfamiliar consequences of actions taken in cyberspace.[25] Authentic and complete control in cyberspace is illusory; the individual user is typically unaware that she is not "driving" her search engine, or catalog website, through cyberspace, but that their operation reflects the functioning of unseen algorithmic instructions in a way that may not equate to commensurate activities in the physical world. Unlike the course of a car on the road, the route of data packets sent through cyberspace with a click of the mouse is invisible to the user.[26] The user's actions send the packets on their way, but what

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23. *See* DONALD A. NORMAN, THE DESIGN OF EVERYDAY THINGS 22 (Doubleday 1990) (1988) (describing the automobile "system" as "understandable" because "the relationships among the user's intentions, the required actions, and the results are sensible, nonarbitrary, and meaningful").

24. Of course, there is also control over the interface (and, therefore, the user) being expressed by the automobile's manufacturer; the shape and design of the dashboard accoutrements may be influenced by such factors as safety and aesthetics, the standards for which may derive from governmental regulation or the commercial market. *See, e.g.*, 49 C.F.R. § 571.101(S1)–(S5.2)(i) (2002) (setting forth "requirements for the location, identification, and illumination of motor vehicle controls and displays"), 49 C.F.R. § 571.203(S1)–(S5.1)(b) (2002) (setting forth "requirements for steering control systems that will minimize chest, neck, and facial injuries to the driver as a result of impact").

25. The Open Systems Interconnection Model (OSI), on which some computer networks are based, has seven layers of operation separating the user experience from the actual electrical signals transmitted between machines. HENRY H. PERRITT, JR., LAW AND THE INFORMATION SUPERHIGHWAY § 1.02[E], at 10–11 (2d ed. 2001). These layers include the physical transmission of bits, the encoding of data packets, security, and the presentation to the user, among others. *Id.* § 1.02[E], at 11; PETE LOSHIN, TCP/IP CLEARLY EXPLAINED 76–78 (4th ed. 2003). *See also id.* at 13–17 (discussing commonly used network terms and protocols). According to Pete Loshin, "the vast majority of networked systems now support [Transmission Control Protocol/ Internet Protocol or] TCP/IP, while OSI-compliant networks are an endangered species" *Id.* at 76.

26. *See* James H. Moor, *What is Computer Ethics?*, 16 METAPHILOSOPHY no.4 (1985), *reprinted in* CYBERETHICS: SOCIAL & MORAL ISSUES IN THE COMPUTER AGE 23, 30 (Robert M. Baird

follows—whether good or bad—is controlled from behind the interface, through the computer code on which cyberspace (and much of the interface) is built.[27]

Thus, cause and effect behavior in cyberspace may be determined, by and large, in advance by programmers—programmers who may be writing computer code to enable certain functions, or allow certain actions, at the direction of governmental authorities or market actors, if not for their own ends. This is what distinguishes the automobile and Internet interfaces. While governmental regulators and automobile manufacturers manage the control a driver has over a car by design, the mechanical laws of the physical world impose limits on that management—limits that do not affect many activities occurring in cyberspace. An automobile's user interface and a cyberspatial interface may both be intended (among other things) to facilitate use, but the nature of the reality we call cyberspace allows actions and their consequences to be hidden, with many users unaware that there is anything at all to hide.

This is not to suggest that cyberspace is entirely unconstrained by the mechanical rules of the physical world. Cyberspace does not work by magic—there are hard systems, storage devices, cables, etc., that serve as the physical foundation from which it operates.[28] But the physicality of the platform—the hardware itself and the places in which it is located—is not cyberspace. Nor are protocols and software equivalent to cyberspace. While computers must follow the mechanical rules of the physical world and binary logic in order to operate, the "place" whose existence the computers enable—cyberspace—need not follow such rules. Cyberspace transcends the physical and software systems that enable its existence—leaving it occupying no meaningful physical space.[29] The constructed world of cyberspace has aptly been described as "place-ial," and not spatial: in cyberspace, "we can move from place to place but without having to traverse distance; we can arrange places the way we want without worrying about violating the rule that two objects can't occupy the same space at the same time; the symmetry of nearness can be broken."[30] In other words, for all intents and purposes, actions in cyberspace can have almost any effect

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et al. eds., 2000) (discussing "the invisibility factor" and noting that, "[m]ost of the time and under most conditions computer operations are invisible").

27. *See id.* at 30 (describing how the "invisibility factor" may have ethical consequences).

28. *See* WEINBERGER, *supra* note 6, at 28 (discussing the physical construction and operation of what is commonly referred to as the "Internet backbone").

29. Jane C. Ginsburg, *The Cyberian Captivity of Copyright: Territoriality and Authors' Rights in a Networked World*, 15 SANTA CLARA COMPUTER & HIGH TECH. L.J. 347, 361 (1999).

30. WEINBERGER, *supra* note 6, at 51.

the programmer desires; actions created by computer code need not be constrained by the ways in which cause leads to effect in the physical world.

As a result, there are many circumstances in which knowledge of the physical world will have limited application in cyberspace. In the physical world, for example, we assume that information in its material form can be destroyed. Information contained in the medium of paper can be shredded, burned, or recycled.[31] In cyberspace, by contrast, there exists nearly infinite capacity in which to house digitized information: in a digital realm, a real possibility exists that whatever has been will, in some sense, always be. Thus, shared assumptions in the community about the inherent destructibility of information in its material form—which help us to contextualize and give meaning to actions regarding that information—do not necessarily apply in cyberspace.

Similarly, in the physical world, we believe that relative personal anonymity and privacy are possible (although, perhaps, never absolute).[32] Shared assumptions that deter privacy invasions in the physical world, like the prohibitive social and financial cost of violating privacy, may not apply in cyberspace.[33] Unlike the text of a snail-mail letter, the text of an e-mail message can be sent to countless individuals, against the author's wishes, with little effort and at minimal cost.[34] While the fact of individuality may persist in cyberspace, an anonymous or unobserved existence may be impossible, and values like privacy—which is arguably essential to both

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31. *See, e.g.*, Harry Wingo, Note, *Dumpster Diving and the Ethical Blindspot of Trade Secret Law*, 16 YALE L. & POL'Y REV. 195, 201–02 (1997) (discussing various methods of destroying trade secret information).

32. This belief animates the Fourth Amendment to the U.S. Constitution, which states: "The right of the people to be secure in their persons, houses, papers, and effects, against unreasonable searches and seizures, shall not be violated . . . ." U.S. CONST. amend. IV.

33. Depending on the circumstances, one whose privacy has been invaded may seek to impose liability and recover damages through a common law claim, *see* RESTATEMENT (SECOND) OF TORTS § 652A–652I (1977) (explaining privacy torts, including intrusion upon seclusion, false light, and misappropriation), or an individual may elect to bring a claim pursuant to a particular privacy statute, like the Video Privacy Protection Act, 18 U.S.C. § 2710(b)(1) (2000), which allows civil suits for damages against video tape service providers who knowingly disclose the titles of videos rented by customers.

34. *See* Posting of James Grimmelmann, Accidental Privacy Spills: Musings on Privacy, Democracy, and the Internet, to http://research.yale.edu/lawmeme/ (Feb. 19, 2003, 22:02:50 EST) (noting that "[e]-mail can spread like wildfire, but unless you get a copy of your snail-mail letter into a major newspaper or can afford a massive direct-mail spam, it stops with your friends"), *at* http://research.yale.edu/lawmeme/modules.php?name=News&file=article&sid=938 (on file with *Vermont Law Review*).

self-development and the development of personal and commercial relationships—are likely to suffer if individuals assume otherwise.[35]

It could be argued that the mechanical rules of cyberspace do not create environments that are entirely foreign. After all, numerous human transactions, like sending and receiving letters, are, like interpersonal communication through e-mail, nonspatial and asynchronous, and nevertheless are phenomena that individuals comprehend. But written letters do not create a broadly shared social space, and the medium of the postal service is inadequate to host the sort of social interactions and community-creation that may thrive in cyberspace. Even if the postal system is regarded as a species of social space, moreover, its operation necessarily adheres to the mechanical rules of the physical world about which some common understanding exists.

Absent an ability to conceptualize cyberspace independent of its masking interfaces, individuals may reasonably assume that life works in cyberspace much as it does in the physical world, and they are likely to conduct themselves in cyberspace without regard for the consequences of their actions. They will assume that documents cease to exist when they are deleted, and that privacy obtains in cyber communication as it would in letters sent through the postal mail. If the lawmakers, regulators, market actors, and programmers who are molding and shaping cyberspace are to make wise decisions, then the individuals to whom these actors are or should be accountable must have a straightforward and accessible conception of cyberspace. It must be a comprehension that affords non-technical people the conceptual tools with which to foresee the consequences of actions in cyberspace—their own actions and the actions of others—and how decisions about the organization and regulation of cyberspace may affect those actions and, more importantly, the consequences of those actions.[36]

Of course, a perfect shared understanding of how cyberspace works is probably not possible; then again, neither is a perfect conception of how the physical world works. But most individuals know enough, through experience and education, about how the physical world works to be able to integrate new information into an existing conception. To return to the

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35. *See* Lawrence Friedman, *Establishing Information Privacy Violations: The New York Experience*, 31 HOFSTRA L. REV. 651, 655–56 (2003) (discussing the importance of privacy as it relates to autonomy and the development of interpersonal and commercial relationships).

36. As Donald Norman has observed, regarding everyday things in the physical world, conceptual models of the way in which objects work "are essential in helping us understand our experiences, predict the outcome of our actions, and handle unexpected occurrences." NORMAN, *supra* note 23, at 38.

example of the automobile: knowledge of how a car operates influences the extent to which we can hold lawmakers accountable for certain public policy decisions, such as whether to fund road maintenance, or whether to pass stricter drunk driving laws. On the other hand, that knowledge is probably insufficient, in itself, to understand the relevance of fuel efficiency standards. Yet, it provides us with enough understanding to be able to contextualize any new information about fuel efficiency received from outside our personal experience, perhaps from secondary sources in the popular media.[37]

In respect to cyberspace, a similar basic understanding is lacking. The absence of even a rudimentary understanding of how cyberspace operates is so widespread that secondary source information about cyberspace (assuming that information is reliable) cannot be meaningfully integrated into a useful conception of cyberspace.[38] Because a basic understanding is lacking, resolution of foundational issues regarding the structure and regulation of cyberspace will first require an effort to articulate a conceptually accessible model of cyberspace. For instance, if we are going to allow cyberspace to be managed through computer code,[39] an accessible model of cyberspace is necessary for individuals to appreciate the frameworks that guide programmers and the decisions those programmers make about how cyberspace will be structured. These structures and rules translate into sophisticated standards; technical people care about these standards not just because some work better than others, but because the authors of standards gain power and leverage in industry. Standards such as TCP/IP, OSI, and HTML[40] are essential to the smooth operation of cyberspace, and have been subsumed to such a degree that making changes to them is often extremely difficult.[41]

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37. *See id.* at 55–58 (discussing sources of information in the world). Thanks to Jith Meganathan for the example in the text.

38. Media reports about the dangers of data mining, for example, are useful only to the extent one knows about such things as cookies and how they operate. *See supra* note 18 and accompanying text (discussing cookies and their function).

39. *See* LAWRENCE LESSIG, CODE: AND OTHER LAWS OF CYBERSPACE (1999) (arguing that cyberspace can be regulated through code, as well as the software and hardware on which cyberspace depends); *see also* Tim Wu, *When Code Isn't Law*, 89 VA. L. REV. 679, 680–81 (2003) (stating "that code can be used to produce regulatory effects similar to laws").

40. Transport Control Protocol/Internet Protocol; Open Systems Interconnection model; Hypertext Markup Language. *See* PERRITT, *supra* note 25, § 1.02[E], at 10–11 (describing the standards or protocols that define the Internet).

41. These standards are arrived at by social bodies—committees, companies, and associations—that work together in a social space; even technical standards are in this sense socially constructed. For example, OSI is "published by the International Standards Organization [(ISO)]." PERRITT, *supra* note 25, § 1.02[E], at 10. ISO is a non-governmental network of 147 private and public

In addition to the resolution of technical issues, there are multiple aspects of cyberspace that, to be fully addressed, will require some shared understandings—some common conceptual premises—among the individuals inhabiting the global community. Since cyberspace is a social medium, and not just a retail market, rules are needed regarding the consequences of transactions that may be conducted with little—or no—human intervention. Who, for instance, should we hold responsible for automated but erroneous transaction errors? In the social context, given the tendency of on-line discussion to deteriorate into epithets, and its ability to undermine authority, does freedom of expression apply without constraint? Does the possibility of non-anonymous speech mean we should create specially designated areas in which anonymity will be safeguarded not just by convention, but by governmental regulation?[42]

Perhaps most of all, how will our ethical dispositions be realized in the cyberspatial environment—where real but different sorts of harms may be committed than in the physical world?[43] In building information technology systems, decisions inevitably become incorporated into computer code, and then forgotten.[44] Once those operative decisions are reduced to code and subsumed within particular systems, they will repeat again and again, regardless of whether the operations have unethical aspects or effects.[45] In order to make good decisions about what will go into the code on which cyberspace is being built right now, it is important to have some sense of what it is that is being constructed, and how it works—or could be made to work. And so the question remains: how can we make

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standard development institutes. INT'L ORG. FOR STANDARDIZATION (providing background information on ISO), *at* http://www.iso.org/iso/en/aboutiso/introduction/index.html (last visited Nov. 16, 2003). Adoption of the treaty establishing the meter as a unit of measurement in the mid 19th century was a complex social process, yet the English system still persists; our current status may be like the life of scientists before there were standards of measurement. Was the measure of a meter a moral problem, as well as a technical and political one? On the development of the meter as unit of measurement, see KEN ALDER, THE MEASURE OF ALL THINGS: THE SEVEN-YEAR ODYSSEY AND HIDDEN ERROR THAT TRANSFORMED THE WORLD (2002).

42. On the potential use of code to regulate free speech in cyberspace, see Beth Simone Noveck, *Designing Deliberative Democracy in Cyberspace: The Role of the Cyber-Lawyer*, 9 B.U. J. SCI. & TECH. L. 1 (2003) (describing how code can help enforce rules of free speech internally rather than externally).

43. The configuration of cyberspace "necessarily has a moral dimension." WEINBERGER, *supra* note 6, at 52.

44. *See* David H. Gleason, *Subsumption Ethics*,COMPUTERS & SOC'Y, March 1999, at 29, *reprinted in* CYBERETHICS: SOCIAL AND MORAL ISSUES IN THE COMPUTER AGE, *supra* note 26, at 56 ("Subsumption ethics is the process by which decisions become incorporated into the operation of information technology (IT) systems, and subsequently forgotten.").

45. *See id.* at 56–58 (discussing the "subsumption ethics" of computer system design, in which seemingly trivial decisions may have significant moral and ethical impact).

decisions about such matters if we cannot even communicate with each other about the reality of cyberspace?

III. THE SOCIAL CONSTRUCTION OF CYBERSPACE

Perceived reality in the physical world is a social construction. In their groundbreaking book, *The Social Construction of Reality*, Peter Berger and Thomas Luckmann described the process by which individuals are socialized, and the effect that socialization has on individual perceptions of reality in the physical world.[46] For the most part, Berger and Luckmann relied on a phenomenological approach to explain the ways in which individuals engage with one another in social space. Individuals can be said to reside in the physical world in relation to one another, and within social frameworks in which they share assumptions about reality based on a "social stock" of knowledge, which includes social knowledge about the significance of spatial, temporal and other environmental cues, and of course the transcendent mechanical rules of physics and natural phenomena.[47]

Individuals depend on these cues to contextualize information. The cues allow us to both assign meaning to information and temper the shock of new information as we go about our everyday lives. Temporal cues are important, for example, as individuals continually address the temporal structure of everyday life to synchronize that structure with their personal goals and aims.[48] Because there exists a common stock of knowledge about the significance of a particular temporal cue within a social framework—such as, say, the inevitable fact that biological organisms eventually die—individuals can confidently rely on those cues to ascertain context and assign meaning to information.[49]

The ongoing process of social construction of reality mediates the world in which we live; it explains how we function in "everyday life"[50]—how we know more about how the mechanical rules of the physical world constrain the operation of an automobile than we might think.[51] This is the knowledge that allows us to use the automobile interface to control cars. We understand, because of the knowledge gained through the social

46. BERGER & LUCKMANN, *supra* note 4, at 19–47.
47. *Id.* at 41.
48. *Id.* at 27.
49. *Id.* at 26–27.
50. *Id.* at 19.
51. *See supra* notes 22–24 and accompanying text (discussing the operation of automobiles).

frameworks in which we live, and the common reference points therein, what effect certain actions will have via the automobile interface: the car will turn when we move the wheel, the car will speed up when we press the accelerator, the car will stop when we press the brake pedal.

The process by which cyberspatial reality is constructed is much the same as in the physical world. But, because most users journeying through cyberspace are unaware of the nature of the masking interfaces, they may be ignorant of the differences between cyberspace and the physical world, and such ignorance may prevent them from contributing meaningfully to the social construction of cyberspace. There are other individuals, though—often, private citizens—who are exploiting the differences and building virtual worlds. As these individuals become socialized within cyberspace and begin to share assumptions about it, social norms are beginning to develop—and, in the process, cyberspace is being socially constructed.

A. Emerging Norms in Cyberspace

Patterns of behavior indicate the development of social norms, which may be distinguished from the more formal public and private rules that dictate action.[52] These patterns of behavior tell us something about the shared assumptions with which groups and individuals order their lives. In this sense, norm-development is an aspect of the social construction of reality. And it is ongoing. Consider a quotidian activity like smoking:

> [S]mokers in America are regulated by norms. Norms say that one doesn't light a cigarette in a private car without first asking permission of the other passengers. They also say, however, that one needn't ask permission to smoke at a picnic. Norms say that others can ask you to stop smoking at a restaurant, or that you never smoke during a meal.[53]

Behaviors regarding smoking respect established American norms that dictate where and when smoking is appropriate; the norms themselves

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52. As Ann Bartow has explained, "[i]nformal norms are those that develop outside the confines of structured organizations, as contrasted with 'formal norms' imposed by a centralized governing body." Bartow, *supra* note 1, at 19. We commonly refer to those formal norms simply as rules. *Id.*; *see also* Stephen Hetcher, *Changing the Social Meaning of Privacy in Cyberspace*, 15 HARV. J.L. & TECH. 149, 155 (2001) (explaining that "the existence of a rationally governed pattern of behavior is logically distinct from the existence of a linguistic rule").

53. LESSIG, *supra* note 39, at 87.

reflect shared assumptions in the community about the short- and long-term effects of smoke that cigarettes emit and the circumstances in which smokers may expose others to those effects.[54]

By looking at developing norms in cyberspace, we may gain some insight into the ways in which cyberspace is being socially constructed, albeit by a relative minority of individuals world-wide. In this section, we consider the patterns that are emerging from social interaction in cyberspace in respect to on-line gaming and the use of avatars, as well as developing understandings of property.

1. Social interaction

Social interaction in cyberspace occurs in a variety of contexts. One of the more popular is on-line gaming, which is free of physical constraints. In the cyberspatial environment, the physical realities of cause and effect, space and travel are removed. The user interface—the "reality" of the experience—depends only on the skill of the system developers and the activity of social participants; the environment can be made to simulate zero-gravity, underwater scenes, or a completely imaginary space, and game players have the experience of "being in" a virtual environment.[55]

Though on-line gaming play takes place in a created space and created time, user experience is designed to be temporally linear; cyberspatial activities seem immediate, as do the consequences of those activities. Yet, the timing of the user experience—how fast things move—must be

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54. Of course, social norms may ultimately be codified as rules. *See* Jeffrey Abramson, *The Jury and Popular Culture*, 50 DEPAUL L. REV. 497, 518 (2000) (noting that growing public awareness of the adverse effects of cigarette smoke on third parties has lead to an increasing number of smoking bans in public spaces and restaurants).

55. Indeed, it has taken many years of effort to make the user interface seem physically real, such as mathematical algorithms constructed to make a life-like ball drop, calculating artificial shadows as it moves through artificial light. *See* Steven Johnson, *A Chat Room Like No Other*, DISCOVER, July 2003, at 23–24 (describing a virtual world being developed in which avatars representing users are able to realistically convey the users' emotions). One of the most challenging problems of recent years was to create the appearance of believable hair, moving both as individual strands and as waves responding to the movement of air. Jane Sanderson, *Preview:* Final Fantasy: The Spirits Within*: Taking animation to a new level*, TRIBUTE, July 2001, *available at* http://www.tribute.ca/tribute/0701/ final_fantasy.htm (on file with *Vermont Law Review*). For an in-depth analysis of the experience of being "in" cyberspace, see SHERRY TURKLE, THE SECOND SELF: COMPUTERS AND THE HUMAN SPIRIT (1984) (detailing the author's six year experience of living within quickly emerging computer cultures); *see also* SHERRY TURKLE, LIFE ON THE SCREEN: IDENTITY IN THE AGE OF THE INTERNET (Touchstone 1997) (1995) (exploring the psychology of online life, including the ways in which it affects concepts of politics, community, and self).

precisely programmed into the software.[56] Otherwise characters would move too slowly on older computers, and too fast on newer ones. The actual program is running far faster than the user's experience in "real time." In other words, the user experience and the software are operating in different realms of space and time, which intersect at the user interface. Paradoxically, the user has the experience of "being in" cyberspace.

In multi-user games, players construct, often from a set of given parameters, avatars to represent them in the game. In many games, the avatars can continue to play, even when the user is absent; thus avatars may have some level of existence apart from their gaming creators. The avatar may also evolve (within the context of its cyberspatial environment), acquiring and losing attributes over time, based on the experience of the game.[57] Beneath the representation that makes an avatar appear "real" to users, however, the avatar exists merely as a set of computer codes and properties, managed by software programs.[58]

The social reality that on-line gaming and the use of avatars foretells is profound. They reflect social frameworks that alter common physical-world assumptions about love, pain, and the meaning and limits of human interaction, and that may bridge the intersection between cyberspace and the physical world. For in addition to on-line gaming, individuals are using the Internet to engage in such social behavior as romantic matchmaking and civic participation via chat rooms, threaded discussions, and instant polls about public events. These varied interactions indicate that the social norms that have evolved in the physical world may have a limited applicability in cyberspace, if only because the quality of the interaction in cyberspace, freed from temporal, territorial, and physical constraints, may be so very different than similar interactions in the physical world.

For instance, widespread participation in on-line gaming and the use of avatars has resulted in a new understanding in cyberspace of such significant life events as death. In the physical world, "death" is an event with a stark impact; even the closing (death?) of a website, and the company behind it, may affect the lives of many people. But the death of a

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56. *See generally* TOMAS AKENINE-MÖLLER & ERIC HAINES, REAL-TIME RENDERING (2d ed. 2002) (discussing the creation of computer graphics rendering techniques and explaining how they may be employed).

57. For an analysis of the issues of liberty and property within the context of a cyberspatial environment, see Richard Volkman, *Digital Culture: Liberation that was not Meant to Be*, *in* THE TRANSFORMATION OF ORGANISATIONS IN THE INFORMATION AGE: SOCIAL AND ETHICAL IMPLICATIONS 863 (Isabel Alvarez et al. eds., 2002).

58. *See* Johnson, *supra* note 55, at 24 (discussing latest developments in the software behind realistic avatars).

game character or an avatar may be just a minor setback for the user. And, while activities in the physical world leave evidence of their occurrence, the death of a game character or avatar is different from the death of a physical body due to the nature of digital information: with a digital palimpsest, the possibility exists that the original thing itself can be recreated. From that possibility, and at least in respect to on-line gaming and other activities that are employing avatars, a new understanding of what "death" means is emerging in cyberspace.

2. Property

Individuals have a different understanding of property in cyberspace than in the physical world. Indeed, the very notions of possession and ownership, mainstays of property law, are being challenged by cyberspatial behavior.[59] The operating system Linux has been created through the combined efforts of individuals the world over, each contributing to its creation, modification and refinement without claiming ownership.[60] Similarly, other individuals have created so-called "freeware" that may be accessed and used by others without a need for payment—unlike, say, car rentals in the physical world.[61] And individuals across borders routinely share data files in a way that belies traditional conceptions of property ownership: for a few dollars on the streets of Moscow, one can buy a single CD with the collected works of popular musicians.[62]

This activity represents a new appreciation of what it means to own and possess objects and ideas. As businesses adopt computer code that protects intellectual property from being copied, "computer hackers" inevitably will find digital solutions that undermine those new protections. Because of the mechanical rules of the digital realm, the idea of property as exclusive is

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59. As Alred Yen has observed, "[a] recurring theme in modern copyright law is the notion that Internet technology unacceptably threatens the security of copyrights." Alfred C. Yen, *A Personal Injury Law Perspective on Copyright in an Internet Age*, 52 HASTINGS L.J. 929, 929 (2001).

60. *See* LESSIG, *supra* note 39, at 104–05 (detailing the origins of the Linux system, which began when a college student at the University of Helsinki posted his idea on the Internet and asked others to help him "turn it into an operating system"); Christian H. Nadan, *Open Source Licensing: Virus or Virtue?*, 10 TEX. INTELL. PROP. L.J. 349, 354 (2002) (discussing the origins of the Linux operating system); Michael J. Schallop, *The IPR Paradox: Leveraging Intellectual Property Rights to Encourage Interoperability in the Network Computing Age*, 28 AIPLA Q.J. 195, 261–62 (2000) (same); Charles C. Mann, *Living With Linux*, THE ATLANTIC MONTHLY, Aug. 1999, at 80, 82 (same).

61. *See* Michael Rustad & Lori E. Eisenschmidt, *The Commercial Law of Internet Security*, 10 HIGH TECH. L.J. 213, 242 (1995) (discussing the nature of "freeware").

62. *See* William J. Kovatch, Jr., Comment, *Joining the Club: Assessing Russia's Application for Accession to the World Trade Organization*, 71 TEMP. L. REV. 995, 1036 & n.392 (1998) (reporting on the availability of pirated intellectual property in Moscow).

increasingly unrealistic: as recording and film industry executives are fast discovering, it is just too easy to make copies of digital objects.[63] And so social norms are developing around the ease of copying—much to the chagrin of copyright-holders, as evidenced by the popularity of such systems as Kazaa, Morpheus, and Napster[64]—within certain cyberspatial social frameworks. Especially among young persons, a common knowledge is growing about the limitations of exclusive ownership and, as a result, a new construction of this cyberspatial reality is taking shape, with its own cues for determining meanings, responsibilities, and rights.[65]

B. Components of an Accessible Conceptual Model of Cyberspace

Behaviors associated with on-line gaming and the use of avatars, as well as evolving understandings of property, herald the emergence of identifiable social norms in cyberspace. But these behaviors do not, even taken together, amount to an accessible conception of cyberspace, or, more broadly, represent a move toward a comprehensive public management design. These patterns of behavior represent preliminary and relatively ad hoc efforts at social construction, in respect to just a few of the very many ways in which the Internet serves—or may serve—as a medium of large-scale social interaction. The patterns themselves evidence the social construction of cyberspace, albeit among a relative minority of users.

And even these patterns must be understood within a conceptual framework—indeed, there is no saying whether the individuals who are establishing the patterns understand why or how the mechanical rules of cyberspace allow them to do what they do. This, too, is why we need to think about ways in which to articulate a conception of cyberspace that conveys some sense of how it can be positively understood by reasonable persons, apart from (but in addition to) both the physical world and the cyberspatial user interface. For the better individuals understand how cyberspace works, the better they will be able to make decisions about how to shape it, and, at the same time, to exercise more conscious control over its social construction.

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63. *See* LEE A. HOLLAAR, LEGAL PROTECTION OF DIGITAL INFORMATION 135 (2002) (discussing the ease with which digital objects can be copied and distributed).

64. KAZAA, *at* http://www.kazaa.com (last visited Nov. 13, 2003); MORPHEUS, *at* http://www.morpheus.com (last visited Nov. 13, 2003); NAPSTER, *at* http://www.napster.com (last visited Nov. 13, 2003). All three of these websites are file-sharing utilities operated by way of peer-to-peer networks.

65. *See* Charles C. Mann, *The Year the Music Dies*, WIRED, Feb. 2003, at 90, 92–93 (discussing the ways in which traditional notions of property are failing in cyberspace and its effect on record labels).

This does not necessarily mean that every person must (or even could) have an intimate understanding of the technology underlying the Internet, but individuals at least ought to have a basic, shared understanding of cyberspace. This understanding must be sufficient to allow individuals to appreciate how actions in cyberspace have different consequences than similar actions do in the physical world, and how decisions made at particular levels of organization—such as through governmental regulation or computer code—may influence the ways in which cyberspace functions. The ability to conceptualize cyberspace in this way should be a prerequisite to the democratic organization and regulation of social behavior in cyberspace—regardless of whether those rules come from code, governmental regulation, or market forces.

The conceptual model should be accessible to individuals who are not necessarily computer literate, and it should transcend economic, national, cultural, educational, and age differences. For example, current society contends with an ironic demographic disconnect: those who intuitively have a sense of the Internet may be too young to participate in debates about policy alternatives regarding cyberspace, and those who are old enough to participate in such debates may lack any real understanding of the Internet. When it comes to e-mail, younger users often will accept the lack of control they have over what they send, and intuitively understand potential consequences.[66] Older users, on the other hand, may rewrite each e-mail as if it were a letter to a newspaper, uncomfortable with the thought that it could be read by many people. The young may not care much about private communication, while older people may suffer a paralysis with its loss.

In sum, it is necessary to understand cyberspace conceptually because its potential is limited only by what our imaginations can convert to code; because interfaces are just masks and interactions in cyberspace that do not necessarily have to mimic their counterparts in the physical world; and because, at a certain level, users may well shift their *existence* to cyberspace when they are fully engaged. Absent a basic understanding of cyberspace, individuals across the globe cannot take part in meaningful discussion about what to do with it, or in it. The alternative is indirect regulation—through the impact of self-interested decisions and subsumed architecture[67]—

66. *See* Jeffrey Toobin, *Letter from Cambridge: Speechless*, THE NEW YORKER, Jan. 27, 2003, at 32–33 (reporting on the ease with which an e-mail's contents spread through Harvard University, igniting awareness and controversy over the politics and previous statements of a poet invited to speak at the University); Grimmelmann, *supra* note 34 (distinguishing between the ability of e-mail as opposed to postal mail to spread quickly to multiple viewers).

67. *See supra* notes 44–50 and accompanying text (discussing subsumption ethics).

imposed by the lawmakers, code-makers, or market actors who have the knowledge and power with which to capitalize on the potential of cyberspace. The resulting framework would likely prove to be limited, incoherent, and detrimental in the long run to those individuals who cannot understand, at any level, what cyberspace is and how it works.

IV. CONCLUSION: ARTICULATING AN ACCESSIBLE CONCEPTION OF CYBERSPACE

The reality created by the bits, protocols, and asynchronous transfer capabilities of cyberspace is different than one of houses, neighborhoods, towns, and nations. To someone whose only basis of knowledge lies in the social frameworks of the physical world, cyberspace without a familiar masking interface is alien. As one user described cyberspace:

> I don't know what it is. I use it, but I don't understand it. It allows me to work from home effectively, it gives me more than what I need, and it allows me to send pictures of my son to my family. Overall it has had a very positive impact, considering the fact that we are basically strangers, cyberspace and I.[68]

Individuals all over the world are increasingly engaged in cyberspatial activities. Many of these individuals may be blissfully ignorant of the fact that their assumptions about the physical world, and their common stock of knowledge about those assumptions, may have little application in the virtual world. In the interest of optimal public management, we need to understand at the conceptual level the potential of cyberspace—to articulate both social constraints and possibilities in a way that helps individuals to grasp how things may be different in cyberspace—lest those few with that knowledge end up managing cyberspace for the rest of us. Not least, as more aspects of life move into cyberspace, we should prefer that its organization and regulation utilize the medium's full potential while at the same time allowing for democratic governance. Democratic governance, after all, is still the best means by which to preclude tyranny, and also the most likely to lead to an appreciation of "the good" endorsed by a plurality of cyber-citizens.

How might we begin to articulate an accessible conception of cyberspace? As an initial matter, we might be clear about what cyberspace is not. It is not the physical world, and it is not a "parallel universe." It is

68. Interview with Sonia Caus Gleason, Educational Consultant (Jan. 15, 2003).

not the creation of any one person or group of persons. It is not its protocols, and it is not the machines or software on which it runs. It is connected to all these things, and yet it is something transcendent; it is neither purely technical space nor purely social. The challenge is to define it positively. Given a history of human development that evidences the ability to imagine what lies over the horizon—on the other side of the Atlantic Ocean, on the dark side of the moon, or in deep space at the dawn of time—the task of conceptualizing cyberspace in a universally accessible way is surely not beyond our grasp.