Fordham Law Review

Volume 74 | Issue 2 Article 6

2005

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Recommended Citation

Beth S. Noveck and David R. Johnson, *Society's Software* , 74 Fordham L. Rev. 469 (2005).
Available at: http://ir.lawnet.fordham.edu/flr/vol74/iss2/6

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SOCIETY'S SOFTWARE

*Beth S. Noveck and David R. Johnson**

INTRODUCTION

The First Amendment serves many purposes both individual and social. It facilitates the expression that is the cornerstone of self-fulfillment and self-realization. It also serves to diffuse societal violence[1] by allowing for an airing of controversial opinions and diluting the ill effects of harmful speech. The First Amendment is credited with safeguarding the proverbial marketplace of ideas,[2] and thereby facilitating an evolutionary process that allows good ideas to propagate. Scholars from Professor Alexander Meiklejohn[3] to Professor Owen Fiss[4] see free expression as a political freedom essential to democracy. Professor Jack Balkin argues that free speech secures the right of individuals to participate in the production and distribution of culture, not simply politics narrowly understood.[5]

All are incorrect, at least in emphasis, to suggest that core First Amendment goals revolve entirely around freedom for individuals to speak their own minds. In an era of computer networks and peer production technologies,[6] we increasingly produce both democracy and culture collectively. The group, not the individual, is the central speech actor, the crucible where individual opinions are combined and refined, where the resulting group speech is translated into action and amplified by money.

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1. Whitney v. California, 274 U.S. 357, 375 (1927) (Brandeis, J., concurring) ("[T]he path of safety lies in the opportunity to discuss freely supposed grievances and proposed remedies.").

2. N.Y. Times Co. v. Sullivan, 376 U.S. 254, 270 (1964) (emphasizing that the central purpose of the First Amendment is to foster "uninhibited, robust, and wide-open" debate on public issues).

3. *See* Alexander Meiklejohn, *The First Amendment Is an Absolute*, 1961 Sup. Ct. Rev. 245, 255; *see also* William J. Brennan, Jr., *The Supreme Court and the Meiklejohn Interpretation of the First Amendment*, 79 Harv. L. Rev. 1, 12 (1965).

4. *See* Owen M. Fiss, *Free Speech and Social Structure*, 71 Iowa L. Rev. 1405 (1986); *see also* Owen M. Fiss, The Irony of Free Speech (1996).

5. Jack M. Balkin, *Digital Speech and Democratic Culture: A Theory of Freedom of Expression for the Information Society*, 79 N.Y.U. L. Rev. 1 (2004).

6. For more on peer production, see Yochai Benkler, *Coase's Penguin, or, Linux and the Nature of the Firm*, 112 Yale L.J. 369, 375 (2002) (stating that "decentralized information gathering and exchange" in the form of commons-based peer production is an alternative model to the market or the firm as a way of organizing the production of value).

The group is not merely an aggregate of individual opinions, but a first-order actor with its own distinct voice. Free and democratic societies are those in which we create and belong to social groups. Professor Mancur Olson pointed out fifty years ago that modern societies are characterized by the proliferation of voluntary social groups.[7] Alexis de Tocqueville saw our tendency to embed ourselves in a multiplicity of groups as key to the American character.[8] Political theorists from Jean-Jacques Rousseau to John Rawls have long viewed group deliberation as the democratic ideal to which we must aspire.[9] In groups, we transform private prejudice into public reason. In groups, we generate more effective solutions. In groups, we are each able to accomplish more than we can accomplish when acting alone, and this includes the formulation and distribution of effective cultural and political speech.

Regardless of one's vision of the First Amendment—as serving the individual or society or as safeguarding democracy or culture—all of these goals are served through participation in groups. The group, not the individual, is the most important source of the speech through which democracy and culture are produced. Ideas may originate with individual authors or leaders or thinkers, but it is through the group's adoption of those ideas that they have political force or wide cultural impact. This is not to denigrate the importance of the charismatic leader, but groups—unions, trade associations, churches, organizations, and corporations—are among our most important speakers. When a group speaks with one voice, after internal deliberation, and with the support of its members, we take that speech more seriously—not just because there are more speakers, but also because the speech in question is the product of an internal deliberative process that engages the participants.

Hence, if we are concerned about the goals of the First Amendment, we do not need to focus simply on how to facilitate and regulate free expression by individuals. Rather, we need to focus on how people speak

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7. Mancur Olson, The Logic of Collective Action: Public Goods and the Theory of Groups 1 (1971) ("[M]ost (though by no means all) of the action taken by or on behalf of groups of individuals is taken through organizations.").

8. Alexis De Tocqueville, Democracy in America 242 (J.P. Mayer, ed., George Lawrence, trans., Doubleday 1969) ("Americans of all ages, all stations in life, and all types of disposition are forever forming associations. There are . . . a thousand different types—religious, moral, serious, futile, very general and very limited, immensely large and very minute.")

9. Jean-Jacques Rousseau posited that individuals must govern themselves collectively according to the "General Will" which reflects the common public interest, rather than the particularistic interests of individuals. *See* Jean-Jacques Rousseau, *The Social Contract*, *in* The Social Contract and Discourses 27 (G.D.H. Cole trans., 1950) ("If, when the people, being furnished with adequate information, held its deliberations, the citizens had no communication one with another, the grand total of the small differences would always give the general will, and the decision would always be good."); John Rawls, Political Liberalism 224 (1993); *see also* Joshua Cohen, *Deliberation and Democratic Legitimacy*, *in* Contemporary Political Philosophy: An Anthology 143-55 (Robert E. Goodin & Philip Pettit eds., 1997).

as a group and how technology might change the conditions for group speech online.

Groups speak (and act) by coordinating the various roles of group members. Who sets the agenda? Who votes? Who participates? Who acts and how? The ability to manage roles is crucial to developing the trust and cohesion essential to acting as a group. To do so often requires face-to-face deliberative processes and these, in turn, must sometimes be supported by legal rules and procedures. When the Sierra Club wants to speak as a group to the Environmental Protection Agency, it coordinates a postcard campaign, but relies on its corporate officers to dictate the message. But technology is changing the way we divvy up roles and the way we deliberate as part of that process. These changes are not only affecting the way groups speak, but they may also be creating the condition for new types of group speakers to form, and new ways for the group to speak as a group. This Article argues that, because new technologies may radically alter what it means to assume roles, it can therefore change what it means to operate as a group online. Done right, the technology itself facilitates the more dynamic, flexible, and effective groups essential to free expression.

Up until now, cyberspace has been optimized for the broadcast of information, targeted communications among friends, and market transactions. It creates powerful individual bloggers but lacks good mechanisms for effective group speech and group work, for which even the most charismatic individual cannot substitute. While in the real world we are accustomed to corporations, juries, unions, political parties, and other collective bodies expressing themselves, in cyberspace we have not yet evolved mechanisms for structuring group life, despite the fact that the Internet can connect us. We understand the way the Sierra Club speaks but we cannot yet imagine how a blogging community or even a Meetup might do so. While we have tools to engage in some collaborative activities, we have few ways to form and sustain productive and robust groups. In a world in which money buys effective speech, it is still not easy for an online group to achieve the kind of coherence that would allow it to make a collective statement or open a bank account.

We still rely heavily on face-to-face practices[10] because in person we understand how to adopt the roles necessary to speak as a group by means of deliberation. We have developed elaborate structures—both law and social norms—to regulate those roles and manage deliberation. We all have an implicit understanding of how trust and reciprocity emerge face-to-face. We believe we must be in a room with a small group of people we trust or can come to trust through some institutionalized procedure. But cyberspace does not provide the structures and practices that help real world groups

10. This explains in part the success of Meetup, and the conviction, even among staunch Internet advocates, that face-to-face is a precondition for effective action and activism. *See* Joe Trippi, The Revolution Will Not Be Televised (2004) (describing the phenomenon of Meetup and its impact on the Howard Dean presidential campaign).

collaborate effectively. We can't tell when the other members of the group are paying attention, nodding or nodding off. We cannot sense a shared commitment in the room to support a particular articulation of the group's goals or position. While we know how to chat, we are ill equipped to engage in sustained deliberation or collective decision making. As a result, despite the growing ubiquity of connectivity, we still find ourselves without robust online organizations that can speak easily or even open a bank account. A disconnect exists between online activity and the means of expression, action, and power.

To explore our contention about technology's impact upon the ability to define, adopt, and implement roles within a group, Part I addresses how new technology changes the underlying conditions for the formation of groups generally. Part II then focuses on the specific challenges that new technology poses to adopting roles. Part III describes what we term the Social Grid, loosely modeled on distributed grid computing that may offer a paradigm for managing roles. Part IV introduces a second technological solution, which we term the Group Avatar, the interactive graphical screen representing the group, which might make the group and the roles participants play in it manifest on the screen. Together, the Social Grid and the Group Avatar may allow us to see more clearly that notionally fictional social groups (organizations) have real goals, memories, actions, and speech of their own. By combining a schema for managing permissions with new kinds of visual screens, we will be able to more easily assign and adopt roles within a group, and to deliberate more effectively. These technological developments may be arriving just in time to allow us to evolve the more flexible and complex social institutions that are needed to cope with the complex environment created by a global, networked economy. We argue that we should exploit this new opportunity to create an online infrastructure for collective action.

I. THE GROUP IN CYBERSPACE: FROM FACE-TO-FACE TO SCREEN-TO-SCREEN

Interesting (and potentially good) things happen when we view society through the interactive, networked screens of our computers. While some organizations may simply shift the locus of their meetings to the computer, technology may also enable the creation of new kinds of groups. This section surveys generally the potential impact of technology on robust group formation and operation.

We should start by clarifying what we mean by "robust group" (which we use interchangeably with "group").[11] Unfortunately, despite its imprecision, there is no better term to apply to a collection of individual actors who share a purpose and who define their roles with reference to a

11. For a longer discussion of the impact of technology on group dynamics, see Beth Simone Noveck, *Democracy: The Videogame*, *in* The State of Play: Law and Virtual Worlds (Jack Balkin & Beth Simone Noveck eds., forthcoming 2006).

shared imaginary collective. Perhaps we might call it a cabal, were it not for the pejorative connotation that this and so much of our rhetoric relating to groups carries. We lack the vocabulary to describe sustained collaborative yet unincorporated groups of people. We do not mean a mere category, or a formless crowd, or a transient audience. We do not mean an emotional community, a term that has been overused and co-opted to describe just about every activity on the Internet, from participation in a Listserv to joining eBay. There is no good vocabulary in place yet to describe a collection of people who share a purpose and act together in concert to accomplish their goals. While a robust group could include a formally organized corporate team within an organization, it also includes a team of otherwise unrelated law professors coming together to write an amicus brief. A network of consultants who pool their attention and expertise to accomplish a joint project is also a robust group. A collection of pug dog owners who meet up and then, recognizing a common interest, come together to build a dog run in the park is also a robust group. These are robust groups because they aim to accomplish something together as a group. While robust groups are not a new phenomenon, new technology could be particularly conducive to the proliferation and success of precisely these types of groupings.

Groups have boundaries that delineate the group and membership in the group. We have to feel ourselves to be part of something and be able to identify that something. It is a form of social order shared by the collective consciousness of its members. Groups need not exist forever, or for any set length of time, but they must be persistent enough to accomplish the goals of the collective. Groups possess assets, whether financial, informational, influential, or some other form of resource that allows the group to operate. Those assets may be inadequate to the task, but they contribute to the shared perception of the group as a distinct entity separate from its members. At a minimum, a robust group must exist as an independent and identifiable entity in the minds of its participants, whether the group is legally constituted or not. The pug owners must not simply consider themselves part of a class, but must see themselves as belonging to a specific group with a shared goal—building a dog run.

The legal fiction of the group allows each member of the group to define his or her membership in relation to the goals of the group and the action of its members. In other words, while a law professor has an identity as a member of her faculty, she defines herself as part of the amicus brief writing group and conceives of the actions she must take (writing a particular section, doing research on another, proofreading) as part of that community in order to achieve the desired outcome. While some groups might have fixed participants, it is also frequently the case that a group will have different members fill a defined set of roles. The part of treasurer, chief executive officer, or voter can be played by anyone with a given set of qualifications, and that person can change even if the role does not. So while some groups depend heavily on the specific personalities of that

group, as we move toward more distributed communities of strangers, the relevance of personality declines and the importance of the functional roles to be played by participants in clearly defined groups increases.

So how is screen-to-screen changing our interactions in groups? First and most obviously, community in cyberspace is no longer dependent on geography or personal bonds. The law professors need not be at the same school; they can collaborate via e-mail. The ability to be near someone has no necessary impact on membership in a group in cyberspace. Groups can span the neighborhood or the globe. Cyberspace has bolstered the ability of groups to form among people with no physical connection or geographic proximity (or even knowledge of each other's location). Because of the absence of any need for a geographical connection, people with common interests, no matter how esoteric—like law professors—can connect to form robust groups. Ironically, the global characteristics of the Internet make it feasible for groups with more and more specialized interests and more tightly constrained goals to act effectively together. (Those who argue that this is a bad thing tend to ignore the corresponding tendency of individuals to become embedded in many more groups and to move among groups, a point which we will discuss shortly).

Moreover, while real life groups depend heavily on face-to-face meetings in real time, online groups are not always dependent on time or conversation in the same way. People online can interact either in real time or asynchronously. Early cyberspatial technologies, from e-mail to message boards, facilitated asynchronous interaction. These are often lacking the necessary immediacy and clarity. But new visual and graphical tools permit visual deliberation, the exchange of views through pictures in addition to words. A group can create images, maps, charts, graphs, and graphical objects to create a shared picture of external events (what the U.S. Army refers to as "situation awareness") and to communicate the evolving state of mind of the group itself, without the need for synchronicity. Mediators have always relied on maps, charts, graphs, and the like to facilitate this process. So instead of having to talk though individual opinions and potential group decisions in words, group members can exchange ideas by placing pushpins on a map to signify where they stand. All can see directly the views of others in the group. The state of mind of the group as a whole is easier to make visible. The group can, in effect, be seen to speak. This enhanced choice of interaction enables us to allocate our attention with much finer granularity, allowing each of us to devote less time to any one group, and so participate in more groups—without the inconvenience and costs of face-to-face meetings.

Furthermore, severing group formation from the geography of space and place and from the constraints of real-time interaction naturally permits groups of different scope and scale than those found in the real world. Networks can connect groups of vast reach, such as the marketplaces that have emerged on eBay, Craigslist, or the political campaigns of MoveOn.org. Large numbers of law professors can band together and

organize a campaign, like the Open Access Law Program,[12] to fight for the rights of authors vis-à-vis law reviews. At the same time, the reduced transaction costs of interaction make it possible to create a niche market of a few professors working on a case of interest only to members of their specialty. It may be that, off-line, relatively small groups are a prerequisite for meaningful engagement and real collaboration. New technology allows the formation of many more such teams. But, in addition, the Internet also may make it possible for larger groups to collaborate, since it can replace the procedures that larger groups use to coordinate work.

It has been suggested that the value of a communications network linking individuals increases as the square of *n* increases (the number of participants).[13] Insofar as the value of the Internet derives from its ability to allow the formation of groups, the value of the Internet grows as a function of 2^n (reflecting the number of new groups that every addition of a new network participant makes possible).[14] More importantly, those myriad groups can build up connections to each other to enable their effectiveness to scale. Just as we now have social software,[15] like Friendster, which allows us to visualize the web of our individual social relationships (Jane knows Bob who knows Sue who knows Fred), it will not be long before we have Groupster (Jane belongs to this Amicus Brief group which includes Bob, who is also in the Open Access Project which contains Fred, who is engaged in MoveOn.org, Meetup, and the Amicus Brief group). These larger scale social networking systems will be enabled by the concomitant rise of social reputation systems to support them.

In addition, the independence of online groups from the physical constraints of geography also frees us from some of the problems associated with corporal interaction. In an online environment, no one's bits can beat up anyone else's bits. While we still need to work on ways to screen out unwanted bits (like spyware and spam), the very nature of bits (as contrasted with atoms) eliminates many of the problems of physical violence (and, potentially, discrimination)[16] as applied to people in real space. When the threat of physical force is removed, association in groups can be more voluntary.[17] It is easier to leave an online space than it is to

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12. Open Access Law is an organization of law professors committed to promoting nonproprietary publishing models for legal scholarship. Open Access Law Program, Science Commons, http://science.creativecommons.org/literature/oalaw (last visited Sept. 6, 2005).

13. *See* Metcalfe's Law, Wikipedia: The Free Encyclopedia, http://en.wikipedia.org/wiki/Metcalfe%27s_law (last visited Sept. 14, 2005).

14. *See* Reed's Law, Wikipedia: The Free Encyclopedia, http://en.wikipedia.org/wiki/Reed's_law (last visited Sept. 14, 2005).

15. For a thorough discussion and definition of social software, see Michael J. Madison, *Social Software, Groups and Law* (forthcoming 2005) (on file with author); *see also* Clay Shirky, *Social Software and the Politics of Groups*, Clay Shirky's Writings About the Internet, Mar. 9, 2003, http://shirky.com/writings/group_politics.html.

16. *Cf.* Jerry Kang, *Cyber-Race*, 113 Harv. L. Rev. 1130 (2000) (describing the phenomenon of discrimination in online environments).

17. On the other hand, perhaps it is the possibility of getting punched in the nose that makes us pay attention in face-to-face encounters!

leave many real world meetings. This decreased cost of exit is often viewed as a disincentive to building trust and loyalty, and is therefore a negative attribute of cyberspace for collective action. But this simplistic characterization ignores the fact that it also corresponds to ease of entry. Furthermore, reputation and identity will still play a role in online social interaction. But we are conceiving the mechanisms of exit, voice, and loyalty in new ways. Tools are evolving to reintroduce persistent identity (including reliable pseudonyms) in cyberspace and to foster robust group interaction over time.

Finally, while the organizational structure of online groups might be just as hierarchical as real life groups, the social order created through the screen need not be hierarchical or produced top-down. To the contrary, online groups can emerge from decentralized decision making and can be governed by more participatory structures than those that typically characterize real world groups. Despite hundreds of years of democratic theory celebrating more participatory forms of governance, the costs of managing participation in real and widely dispersed groups almost inevitably leads to hierarchical structures of governance in the real world. Changes in information technology alter the conditions that make it necessary to resort to these representative and hierarchical forms. Instead, we can open our minds to more emergent, decentralized, and nonhierarchical social ordering if we consider the possibilities for people to build collaborative structures into the software itself. Imagine, for example, that the group of amicus brief writers uses a tool like H2O,[18] which structures the conversation in such a way that no one sees anyone else's response until everyone has responded. The software thereby encourages everyone to speak and, in certain circumstances, improves upon the dynamics of real world conversation. Or they might use Unchat,[19] a real-time deliberation tool that would allow the professors to choose their own rules of moderation and incorporate them into the software.

By eliminating the hurdles of geography, time, scale, physicality, and hierarchy, technology drastically lowers the transaction costs of forming and operating persistent groups. At the same time, the technology offers the potential for greater control and regulation by the group itself of the modes of its conversation. The tools we are developing might make it possible for us to act—and speak—together in new ways.

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18. *See* H2O, Overview, http://h2o.law.harvard.edu/index.jsp (last visited Sept. 13, 2005).

19. Beth Simone Noveck, *Designing Deliberative Democracy in Cyberspace: The Role of the Cyber-Lawyer*, 9 B.U. J. Sci. & Tech. L. 1, 1-71 (2003) (arguing that deliberation is a communicative practice that can be encoded into software, and describing the Unchat deliberative software design experiment).

II. ROLE REVERSAL: FROM IMPLICIT NORMS TO EXPLICIT SOCIAL STRUCTURES

While the screen frees us from many of the constraints of physical time and space, until now we have viewed these characteristics as a hindrance to forming the group loyalty and cohesion we rely upon in face-to-face interactions. In real space, we rely on implicit structures to manage group work. We use instinctual and emotional cues and clues to generate trust and empathy. At the most basic level, pheremonal connections bind us to one another. The massive amount of information provided by the face and from involuntary body language provides the underlying glue to cement social relationships within the offline group. We add deliberation on top of these implicit connections as a way—albeit a time-consuming way—to divvy up roles. For example, imagine a consultant who accepts a job from a client and then needs to subcontract the work to a group of distributed consultants. He needs one person to talk to the client, one to handle the expenses, one to assume the strategic portion of the project, and one to advise on financial matters. Until now, he has had to rely on face-to-face mechanisms and cultivated friendships to fill and manage these roles. Now, however, we may be able to use the technology to make explicit and to encode the roles and rules that have, until now, been largely implicit or have demanded face-to-face forms of deliberation.

Roles are essential to the functioning of groups—it is the differentiation (or lack thereof) of roles in pursuit of a shared purpose that makes groups effective. Therefore, we need to develop ways to define roles (and associated rules) in cyberspace. Depending on the goal to be accomplished and the norms of the group, different functional roles may be necessary or multiple participants may play the same role (as deliberator, voter, or decision maker). It is commonplace to understand that playing these roles is what enables individuals to tie their actions to a shared, collective purpose—whether it is to get rich or to save the world—and to subordinate individual, private desires to the voice of the public group. People take actions in these roles that they might not and perhaps could not take on their own. Such actions may take the form of contributing something (attention, labor, money, decisions, property, or other assets) to the group. Some actions might require agreement from some specified number or subset of participants. A group that speaks as a group still needs a spokesperson and a means to constrain his or her speech on behalf of the group. In short, while some (though not all) online groups can live without face-to-face emotions or traditional laws governing incorporation, they cannot prosper without a more robust means of creating, allocating, and tracking the roles played by individuals in relation to the group.

We have developed many mechanisms in real world, face-to-face contexts for determining and assigning roles. We have templates for what roles must be filled. In a corporation, for example, we have defined those roles by law and developed procedures by which those filling particular roles are to function. Corporate directors and officers have specified

powers and duties. A jury is another example of a legally constituted and procedurally rich group with defined roles that can (and may only) speak with a voice of its own, distinct from that of any member. We have collectively, socially developed templates for the basic roles to be assumed and filled in a variety of offline contexts. Political theorists differ on the question of what it means for a group to be democratic, but those definitions all address the roles played by members of the *demos*. Deliberative democrats are those who think that all participants must adopt the same and equal roles as deliberator. Representative democrats are those who feel it is legitimate for certain members of the group to assume the role of constrained decision maker. Participatory democrats want all members of the group to take action. All of these debates have naturally assumed a face-to-face context. Political theorists have not thought hard about what these modes of working assume about technology and its limitations.[20]

Indeed, virtually all of our commonplace understanding about social roles and actions in groups assumes face-to-face meeting, physical proximity, and at least some synchronous interaction. In the online environment, we have neither the tradition nor the culture to allow us to create and assume roles easily. We have lacked, but may now be developing, a way to make roles explicit in the context of robust, sustained group action. We can use the technology itself to create the fabric of roles and rules that enable groups to work.

III. THE "SOCIAL GRID"

Two technological innovations have the potential to transform cyberspace into a medium more hospitable to groups and to help overcome the difficulties we have encountered with trying to create roles across a distance and without face-to-face interaction. The first is the advent of better interfaces and computer screens to show the relationship between individuals and the group. These tools are sometimes referred to as social software. Current social software, however, is just the beginning of this trend. Social software generally refers to social reputation and ratings systems. Innovation in the use of the graphical, interactive, networked screen will make it easier to see ourselves in relation to the groups to which we belong. The screen will allow us to visualize, not only relationships and status, but also our roles within those groups and to see and understand the actions and state of mind of the group as a whole. This is, in essence, a new form of visual deliberation. By being able to visualize the group and to focus on its actions, the technology might allow decentralized, online groups to marshal the attention of their members without the need for face-to-face meeting or talking. This evolution in social software is what we describe in the next section as the Group Avatar.

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20. *Cf.* Diana Saco, Cybering Democracy (2002) (arguing that the technological medium defines the boundaries of our vision of the good life).

The second technology that suggests a paradigm construction of social cyberspace, and the one we focus on in this section, is the Social Grid. While not related to grid computing, it borrows the concept of a schema for permissions to suggest a way for organizing groups in cyberspace. At the outset, we must be clear that our discussion of both of these technologies is largely normative. We are laying out our analysis of the technology we could and should build, and are expressing an agenda for further technological development. While the Group Avatar and the Social Grid are possible, neither social software nor the Grid is yet proceeding in the direction in which we would like to take them. Our vision of the Social Grid is largely aspirational. We argue for grid-like tools that help to manage the permissions upon which roles depend.

To explain the Social Grid, let us first examine the original concept of grid computing. Grid computing (the "Grid") started as what is also termed "distributed computing"; that is, sharing the resources of computers connected by a network. Initially, the Grid was conceived of as a way to help pool and share excess computing power.[21] Its proponents have touted the Grid as the best way to accomplish high-end scientific research and the crunching of wicked math problems. But to focus on the Grid as a bigger, badder, faster number cruncher is to miss an important point.[22] The Grid might provide a model—albeit unintentionally—for how to operationalize roles in online groups. This section first explains what the Grid is and its original purpose as a distributed computing platform. It then addresses the social hack, the unintended consequence of the Grid as a method to create social roles in cyberspace. What makes cyberlaw a unique field is that it deals with law-in-motion—with the response of law to new technology, not just the effect of law on technology. The Grid could change the conditions for social interaction and, thereby, change the law itself.

The original idea of a computing grid arose by analogy to electrical power distribution. The idea was to create computing resources as ubiquitous, pervasive, and available as electricity. Grid computing "may be defined as a 'super Internet' for high-performance computing [created] by integrating geographically and organizationally dispersed computational resources, such as CPUs, storage systems, communication systems, data

21. Richard Keck & David Satola, *Beware Gridlock: A New Era in Computer Sharing Is Here. Are You Ready?*, Bus. Law Today, Mar./Apr. 2004, at 53 ("This technology can make easier the pooling of excess computing capacity—as utilities do now with electricity—so that customers with fluctuating demand or lacking capital resources can satisfy their computing needs at lower cost.").

22. "Supercomputing on tap won't live up to to [sic] this change-the-world billing, because computation isn't a terribly important part of what people do with computers. This is a lesson we learned with PCs, and it looks like we will be relearning it with Grids." Clay Shirky, *Grid Supercomputing: The Next Push*, Clay Shirky's Writings About the Internet, May 20, 2003, http://shirky.com/writings/grids.html. Shirky, as always, is right.

sources and instruments, and the researchers themselves."[23] There is a widely held belief in the grid community that developing the Grid, as with electrical power a century ago, will have a transformative effect on innovation and the development of robust new industries and applications, especially in high-end scientific computing.

We can think about the Grid as a new protocol layer. The World Wide Web ("the Web") has a universal standard for information exchange (HTTP) and a universal standard for document presentation (HTML). This standard allows the creation of a globally distributed hypertext—a cooperatively created document. Because of HTML, every web browser knows to display "BOLD TEXT" as bold text. Because of these standard protocols for presenting information and for communicating it across a distance, we can cause one web to exist across millions of servers, connected by telecommunications, and navigable by means of hyperlinks.

In contrast, the Grid is not a document, nor is it hardware. Instead, it is a globally distributed computer program. It will rely upon a standard schema, or what is known as a protocol for exchanging computer code, and a universal standard for executing or running that computer code to enable the interconnection of computers into a true computing web, running complex processes across many machines. These standard protocols that are in the process of being developed do not address formatting like HTML does. Rather, these standards establish ways of expressing who has access to what resources—"permissions"—or, who has the right (or duty) to perform what kinds of actions. It gives us a way of defining roles. That is to say, the Grid, in our view, transforms the Web into a way of managing social relationships. At present, it tackles a very, very limited set of relationships relating to the sharing of computing resources. We do not want to suggest that the Grid as currently conceived will create a technological infrastructure to regulate group activity online, only that we need to start thinking about tools that do.

One concrete, relatively obvious example of the innovation the Grid will provide is the ability for someone to run computer software on another person's hardware without specific, explicit prior permission. That permission will be implicit in the very act of becoming a member of a Grid community.

The software of the Grid may be called an agent. An agent is a form of software that can undertake an action on your behalf. It can execute a transaction, perform a function, or work on a problem, often automatically, if so programmed. For example, if there is a problem for which you or your computer can contribute a piece of the solution, your agent can be authorized to contribute that piece of the work and to interact with other agents to create the complete solution. An agent could also be responsible

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23. J.H. Reichman & Paul F. Uhlir, *A Contractually Reconstructed Research Commons for Scientific Data in a Highly Protectionist Intellectual Property Environment*, Law & Contemporary Probs., Winter/Spring 2003.

for buying or selling an asset, as well as determining when to contribute CPU cycles to the common cause. When the problem is efficient sharing of computer resources, many of the rules governing such interactions may be written into the software in advance.[24]

While initially this new type of Internet will be used to coordinate computing power between machines, the Grid can be understood as a paradigm for the future evolution of social software. The Grid sets up a schema to identify participants in an online environment and establishes permissions. It lets people authenticate other participants and establish rules for cooperative engagement. Most Grid projects are currently focused on negative permissioning; that is, limiting access to personal information and denying permission to resources by unauthorized individuals as a means to coordinate cooperation.

Yet the conundrum for groups is not only how to create negative liberty and limit access to personal data, but also how to create the positive definition of roles within the group; who can do what, not who cannot do what. The law professors writing their brief together need to be able to decide who will author each section, who will edit whose sections, and who has the right to sign off on the overall draft. The network of consultants needs to decide who will undertake to supply particular information, who has the right to disburse the group's funds, who will work at finding new customers, and who will articulate the group's expert conclusions. The Meetup group needs to decide how to manage the building of the dog run in the park. Groups need a way to broker roles without the cost, including the time and resource-consuming practices that face-to-face norms of interaction demand. Even where a group meets face-to-face to establish its initial goals, the role-allocation process is iterative and can be helped by means of tools to do roles on a going forward basis. The Grid itself will not enable these kinds of collaborative activities. We cannot simply map current Grid permissions about computer sharing onto the vastly more complex and messy dynamics of social groups. But we need Grid-like thinking about how to manage roles and how to substitute for the loss of trust-building mechanisms by encoding relationships into the software. We need a Social Grid.

The most interesting uses of new technologies are often those that are unanticipated, such as the hack. Peer-to-peer network technology, which was originally discovered as a means to enable networks to withstand attack, became the key technology for sharing music. Video games,

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24. One form of Grid computing has already been used to coordinate the deployment of vast numbers of personal computers in service of an effort to search for extraterrestrial intelligence ("SETI"). The SETI project asked end users to dedicate some of their unused CPU cycles to analysis of radio signals from outer space. The process was not completely automated, but the resulting collective action—coordinated efforts by a dispersed social group of enthusiasts—provides a taste of the new forms of organization that may arise when we have new protocols for automating the establishment of relationships around shared resources of all kinds.

originally designed for fun and entertainment, are being repurposed to make movies,[25] as well as for all kinds of social experimentation.[26] Hacktivists are using the same strong encryption tools that are used to lock down access to information as a means of transferring censored content into and out of despotically controlled regimes.[27] Similarly, the Grid, originally designed to coordinate computers, helps us to think about how to coordinate people. While the Internet has always had technology (such as passwords) to control permissions, Grid-like technology would offer a schema and the necessary infrastructure to manage the roles associated with collective action of all types.

We need to build the next layer in the protocol stack. The protocol stack traditionally refers to the layers of technology that comprise the Internet as we know it: telecommunications networks and hardware at the base, communications protocols to coordinate transmissions, and software applications and content sitting atop the stack. The Social Grid would be a new kind of protocol in the stack. It is a special form of software that does not just manipulate content but, instead, establishes social relationships. Just as an operating system determines how various portions of your computer interact, the Social Grid might be thought of as the social operating system software. We need to pay attention to the way in which this Social Grid develops, because its architecture will have profound implications for our freedom and empowerment.

If so directed, the Grid might provide us with the basic tools to create and manage roles that are more varied than those offered by face-to-face social institutions. This technology may eventually allow us to create more complex and powerful social groups online than offline. Right now there are a limited number of roles we can play in the groups to which we belong. Because of the attention costs associated with membership in real world groups, we often are passive members with a minimum investment of personal time. This is how most interest groups work. Pay a fee to join, decisions are made by others. Alternatively, we participate to a very high degree with extended involvement, reducing the numbers of groups in which we can play a role. This is part of the problem with groups that depend on traditional forms of face-to-face deliberation: Participation requires a significant commitment of time and effort that most people do not have. We need only think about the way endless meetings with groups in the workplace eat up the day and limit our productivity.

This is not to suggest that there is no inherent value in being deeply committed to and engaged in a group over time. But the aggregate social

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25. *See* Paul F. Marino, 3D Game-Based Filmmaking: The Art of Machinima (2004).

26. For more on the experimentation taking place within virtual worlds, see generally The State of Play: Law and Virtual Worlds, *supra* note 11.

27. Peekabooty is a steganography program designed to smuggle messages underneath innocuous images. *See* Cult of the Dead Cow, http://www.cultdeadcow.com (last visited Sept. 13, 2005); Peekabooty, http://www.peek-a-booty.org/pbhtml/index.php (last visited Sept. 13, 2005).

conversation and the marketplace of ideas are enriched by increasing the number of groups to which we can belong. While we may be heavily involved with one or a few groups, with the right tools we might have the ability to participate in some fashion in many more. Technology makes it possible and cost effective to contribute fifteen minutes of time to some shared problem, and to coordinate that action with others across a network. We can all thus contribute small amounts of our expertise to a greater variety of different causes.[28] With both synchronous and asynchronous communications options, robust information processing, and visualization tools, there is a potential for each of us to become more engaged in new ways. Insofar as new groups think together and speak in greater numbers, our collective conversation will be enriched.

The Social Grid clarifies the boundaries of the group and the roles, rules, and permissions that exist within it. Put another way, the Grid defines the law of the group and makes that law manifest. If we want to create a group with Grid-like software, we can define the goal of the group and set the permissions for membership to ensure appropriate access. While the current focus of actual Grid software (and related projects such as Social Physics) is on managing the basic authentication function and guaranteeing the privacy of personal information, the next step will be to evolve software to define and manage roles and to enforce them through software. Delegations of power to agents to act on behalf of the group can be tracked and enforced. Requirements for collective decision making on certain issues can be automatically implemented. All social groups operate pursuant to rules. The Social Grid makes it possible to translate some of those rules into computer code.

In other words, the code will enforce the social contracts that in the aggregate define the group. It will empower and constrain my decision-making ability as treasurer by letting me withdraw money from a shared bank account only if the appropriate group decision-making process has been completed. If the group has the rule that its money cannot be spent without approval by two-thirds of the active members, that rule can be coded into the group software. If the group has a process for evolving statements (i.e., aggregating opinions) to be made by the group (and its agents) to the outside world, the code can administer that process. If the group needs a member with expertise in a particular kind of math or programming language, business process, or gardening technique to participate in solving a problem, the software can find and engage that person regardless of whether there is any preexisting relationship between that person and other members of the group.

The code will not only reduce the costs of specifying roles, it can make those roles more transparent. Those serving as officers or agents on behalf

28. As Benkler points out, modular projects that can be divided into chunks and distributed to members of a group via a network demand only a small time commitment. *See* Benkler, *supra* note 6, at 378.

of the group, for example in dealings with third parties, will be more readily held accountable for their actions, because those actions can be recorded and made visible immediately for all concerned to see. If we can evolve the technology to create and allocate roles, it will become easier to assure that those roles are filled by the most qualified, experienced, or committed members. It will also be simpler to change who fills particular roles. The group will become nimbler and more responsive.

In short, we think investment in technology to manage roles can and should be directed toward allowing people to speak and act as a group—by enabling the creation of roles, making those roles manifest and implementing their practices and permissions in the fabric of the technology itself.

IV. THE GROUP AVATAR: SEEING THE GROUP

We have focused so far on the benefits of technology for creating and assuming social roles and of administering the rules that constrain those roles. We believe that these are prerequisites to sustaining collective action online and that their absence has accounted for the lack of more effective online groups. But to create the Social Grid, we can also exploit the interactive computer screen to see the group in a new way—to visualize its boundaries and members, to become aware of the role structure, and to hold up a mirror to our collective activities. One of the reasons we meet face-to-face rather than online is precisely because being in a room together allows us to take an inventory of the social order. We can see the team and ascertain our belief in the collective fiction of the group. We can make sure we are on the same page and we can track our collective progress. Being able to see the group forces us to focus our attention on the community and our commitment to it in a way that we might not do when physically separated from each other. We come together to deliberate or to engage in the expression of public, rather than private, reason. This gives us the opportunity not only to exchange ideas and refine them with one another, but also to see those who are our partners in this discussion and to decide on the division of labor. The opportunity to be in the same room in order to get everyone to focus on the collective task at hand (and their own role in that task) has been one of the crucial missing ingredients to coordinating group work in cyberspace.

While collective action depends upon individuals having roles within the group, it also depends upon members having the ability to visualize those roles. Visualizing the group and participants' roles in it, to be clear, does not imply anything about the choice of technology. There is no need to have a photographic image of the collective. By visualize, we mean to make manifest or perceive by whatever means are necessary to facilitate apprehension. We are referring to any process that allows participants to conceptualize the structures and processes that define a social institution. Thus, the graphical screen may do even better than face-to-face meetings as a means of making us aware of the group and its structures. The screen can

be used to make the group more meta-informationally deep. That is to say, the screen can display more information about the group than might appear in an in-person meeting and more information about that information (e.g., its source, quality, and currency). The screen can make the group more self-aware. In short, the networked, interactive screen can be used to make social organizations—and individuals' roles within them—manifest, so that both participants and others can more readily perceive the nature and actions of the group.

This visual representation—or what we term the Group Avatar—need not resemble a human being (or cartoon character) as use of the word avatar might suggest. Rather, the avatar is the online manifestation of the group in whatever form may prove most useful. It is the collective speech, actions, and values of that community as represented on the screen.

What might the Group Avatar look like? At the very least, we can use the screen better to make the membership of the group apparent. We can and should take advantage of the opportunity to use the interface to see the group. We can imagine—and have created—software that arrays the group in a semicircle around the virtual room. Alternatively, with sophisticated new virtual-worlds technologies, it also becomes possible to see representations of the members of the group in a simulated room. Even a list is a useful way to make the boundaries of the group manifest.

But what a list cannot do, that the new, more graphical screens can, is show the relationship between the members of the group and the roles they play relative to the group. The screen is essential to making the roles explicit. Who is the moderator? Who is the treasurer? Who has voting rights? Who has the gavel, the microphone, or the pen? It seems clear to us that the screens we create to go with the Social Grid might make it possible to visualize the extent to which the group values or trusts (or rates low or high on various scales) particular members and/or outsiders. This display of the group membership can also depict the goals of the group and the relationship of each person within the group to achieving those goals.

But the Group Avatar, unlike the Grid, is designed not simply to show individuals in relationship to the group, but to give the group itself a face. The Group Avatar can show the state of mind of the group on the screen. We imagine that the Group Avatar—or numerous interfaces we might create to represent a group—would aggregate and implement the opinions of the group. The Group Avatar would depict the history of the group's actions, how far it has to reach its goal, and actions and states over time. The Group Avatar will tell the current level of the group's bank account, what property it owns, and what instructions have been given to those acting on its behalf.

By making this information manifest through the interface, the Group Avatar will create greater transparency and awareness within the group. In addition, developing the Group Avatar serves other purposes. First, it creates clarity and trust within the group and decreases the costs of coordinating collective action. Second, it gives the participant a sense of

relevance and purpose that further stimulates engagement and belonging. Third, it makes the roles explicit and easier to ascertain and inventory. Fourth, and most importantly, the potential to create a Group Avatar crystallizes what is fundamentally new about the relationship between society and the Internet. While the Internet traditionally has been mostly about discussion and one-on-one transactions, the new generation of social software like the Group Avatar can enable the group to act and speak as a group, online.

If the Grid provides an automated version of the bylaws or constitution of our new cyber-organizations, then the Group Avatar—the visual representation of the group on the screen—provides the equivalent of the headquarters, the annual meeting, and the corporate seal. Like the pomp and circumstance of the courtroom and the other icons of legal legitimacy we rely upon to make the law manifest, the Group Avatar is simply a way to demonstrate the law of the group. It can be both the inward and the outward representation of the group. The Group Avatar should be able to enter into contracts and spend money. The Group Avatar will certainly be able to talk. And it will be able (though perhaps not in real time) to speak with the voice of the group as a whole. If online groups are allowed to open bank accounts, as groups, their speech will become all the more effective.

It is commonplace to assert that if we look at the same thing, we have a common point of reference for our conversation. We have a picture of what the other person means. By sharing the visual totem, we bridge the divide and ambiguity often left by words (and, yes, create new ambiguities too). By externalizing our mental models of what is going on, we think it may be possible to better understand each other. At the very least, it is worth trying to build new screens to test this hypothesis. J.C.R. Licklider wrote as follows:

> When people communicate face to face, they externalize their models so they can be sure they are talking about the same thing. Even such a simple externalized model as a flow diagram or an outline—because it can be seen by all the communicators—serves as a focus for discussion. It changes the nature of communication: When communicators have no such common framework, they merely make speeches *at* each other; but when they have a manipulable model before them, they utter a few words, point, sketch, nod, or object.
>
> The dynamics of such communication are so model-centered as to suggest an important conclusion: Perhaps the reason present-day two-way telecommunication falls so far short of face-to-face communication is simply that it fails to provide facilities for externalizing models.[29]

Thus, there is reason to think that a group will behave differently if they can see what they are doing together. We are not talking about the

29. J.C.R. Licklider & Robert W. Taylor, *The Computer as a Communication Device*, Sci. & Tech., Apr. 1968, at 22-23.

simplistic emotional phenomenon of a wave in a stadium crowd or the oceanic feeling that Sigmund Freud described as being part of a mass or mob.[30] We're talking about seeing yourself in relationship to a complex activity to which you are contributing and in which you are understanding your role. If all members of a group can see the collective effects of their actions, they will be able to insist that the group really serves the goals and values that made them join in the first place. Online groups will have the tools to evolve their collective statements together. From Slashdot-type ratings to Wiki collaborative editing tools, it is becoming increasingly possible to speak as a group. The graphical screen will be able to let us see the state of mind of the group and the underlying rules, roles, and values that went into creating the group's voice.

CONCLUSION

Cyberspace can alter the conditions for robust group life and enhance our ability to engage in sustained collective action online. The distinct characteristics of network interactions may yet turn out to foster group work. They permit social interaction without regard to geography. Interaction can be asynchronous as well as synchronous. As a result, more fine-grained and varied forms of group participation become possible. This will allow cooperation at much smaller scales—an effective member of an online organization may only need to contribute a small amount of effort, or a particular piece of expertise, rather than taking a full-time job defined with reference to some geographic location. Cyberspatial groups can be small or large, but cyberspace makes it easier to find an adequate number of people who share any specific set of goals and can work as a team. In short, cyberspace creates new possibilities for rich, robust forms of group life unlike those we have known before.

We posit that one of the fundamental and unsolved challenges to groups in cyberspace is the cost of differentiating roles within the group. Traditionally, law or social norms dictate and implement the roles participants fill. But these legal procedures and social cues are largely absent in online groups. We have to find a new way to enable the group to allocate roles and to speak and act together. That way, we argue, is to use the technology itself to create and administer the permissions, authorizations, and restrictions that comprise social roles and rules.

While the new Grid technologies are designed to enable the sharing of computing resources, we point out that they might be repurposed to create a Social Grid. Because the Grid potentially provides an infrastructure to manage the roles associated with collective action of all types, it has the potential to become, in effect, Society's Software.

Similarly, the visual, interactive, and networked screen might be used to create a Group Avatar, a graphical manifestation of the group that could

30. *See* Sigmund Freud, Group Psychology and the Analysis of the Ego (James Strachey trans., 1959).

render the group more transparent to both its members and to the outside world. Grid-like technology can make roles enforceable and engender trust. The Group Avatar—and new visual forms of deliberation—can change the way we behave when we speak and act together.

What the Social Grid and the Group Avatar can do to empower online groups is what the law (and physical architecture, costume, and custom) previously did for powerful offline groups. The code of Society's Software will, in effect, create the legal framework to support group work and group speech. It is code that will lower the transaction costs of forming and operating persistent and robust groups. It is code that will allow a multiplicity of groups with differing values to compete for our scarce time and attention. Society's Software will enable groups to take a wider range of actions in the world and engage in behavior that is more complex. Unlike current versions of social software, Society's Software will not be concerned (merely) with dating or job recommendations among circles of friends. It will instead establish the conditions for coordinated activity by teams that do not necessarily arise from within existing corporate, civic, or governmental organizations. This greater diversity of groups and voices that technology might enable will make society richer, more interesting, and itself more complex. This will ultimately serve the goals we have articulated for preserving and enhancing freedom of expression. We will still need the First Amendment (and we will still wish for something like it to arise in a global context), but we will do well also to focus on assuring the evolution of socially empowering versions of the code that administers group roles and the screens that make groups visible. The right design for Society's Software could go a long way towards enhancing the robust collective conversation that the First Amendment seeks to preserve.