

Environmental Website Production: A Structuration Approach

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The Internet has excited much speculation, and a growing body of scholarship, about its potential to advance the communicative power of social movements and other alternative groups. Many scholars and commentators argue that the Internet could help equalize the communication capabilities of unequally resourced actors. They note the relative advantages computer networks provide over other communications media, including their lack of gatekeepers, lower cost, faster speed, and greater reach (Loader, 2008: 1920; Owens & Palmer, 2003: 336; Pickerill, 2003: 1). As an online medium that enables publishing, as well as selected features and functions, websites could be particularly important in this regard. Yet, initial studies of social movement and nonprofit group websites have documented their modest uses of the medium. Social movement group websites display moderate levels of features that provide information, mobilize action and make lateral linkages and low levels of features that foster interaction and dialog or creative expression (Stein, 2009a, 2009b; VanAelst & Walgrave, 2002). Similarly, nonprofit web pages display low levels of information, mobilization, interactivity, and interconnection on both their own and social network websites (Kenix, 2007; Waters et al., 2009: 105-6).

While scholars have described the content of nonprofit and social movement websites, few have paid attention to factors that may structure or shape their communication practices. With respect to social movements, scholars have focused more on how the Internet may reshape social movement structures and practices, and less on how organizational practices and resources shape particular uses of the technology. Thus, some scholars argue that the Internet could help facilitate new, identity-based,

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decentralized, flexible, autonomous, and loosely structured networks of social movement actors (Bennett, 2003a, 2003b; Castells, 2001; Gerlach, 2001; Kahn & Kellner, 2004). Others, observing moderate uses of the Internet by today's activist groups, suggest that organizational structures will need to change before these groups can take greater advantage of the Internet (Fine, 2006; Pickerill, 2003). Few studies examine the organizational context of social movement Internet use. Notable among these are Pickerill's (2003) case studies of how the attitudes, perceptions, ideology, skills, and resources of a handful of radical environmental groups helped shape their Internet use in the late 1990s, and more recent studies by De Cheveigné (2007) and León et al. (2009) of the material resources involved in social movement website production. These works underscore that while technology may influence social movement activities, movement groups can also influence technology use. Considering the iterative relationship between human agents and technology, many scholars have called for more empirical studies of how social movements actually use the Internet, including their perceptions of its costs and benefits and its role in their ongoing communication strategies (Bimber, 1998: 399; Loader, 2008: 1930; Pickerill, 2003: 178)

This study investigates the organizational factors influencing social movement Internet use through an examination US environmental group website production practices. The environmental movement, one of the most central movements of our era, seeks to critique and transform the harmful social and economic practices of industrial capitalism (Castells, 2001: 122; Hutchins and Lester, 2006). In the US, environmental organizations are among the most trusted advocates of the movement (Yearley, 2005: 7). Moreover, US environmental groups have a long history of website production, a large

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base of sympathetic supporters with which to communicate, and documented difficulties communicating through traditional mainstream media (Cox, 2006). Organizational websites are a potentially important communication medium for these groups.

In order to understand how organizational factors shape environmental website practices, I draw on structuration theory and a structuration model of technology. These theoretical approaches highlight the mutually constitutive relations between individuals, organizations and technology, and help illuminate how organizational priorities, processes and resources limit and constrain website production. I use structuration theory to investigate and frame the organizational factors behind actual environmental group website production practices as gleaned from semi-structured interviews with 28 environmental group webmasters. By calling attention to the organizational context of website production, I aim to provide an explanation for studies that find modest website practices among social movement groups, to better understand the processes and practices involved in cultural production online, and to elucidate some of the challenges website production poses for social movement groups.

I begin with a brief examination of structuration theory, particularly the work of Giddens (1984) and Orlikowski (1992). Structuration theory and structuration models of technology provide the analytical categories and distinctions necessary to investigate how organizations shape technology and the range of factors influencing their technology design and use. Structuration theory also provides a conceptualization of agency, and its relationship to power, that I use to elucidate the opportunities and constraints shaping environmental website production. After this review of structuration theory, I report the results of webmaster interviews using categories drawn from structuration models of

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technology, namely webmasters' experiences and perspectives, the organizations' communication goals and strategies, the allocation of resources, and reflexive monitoring of website use. I then discuss how agency and power operate within environmental website production. I conclude that despite webmasters' awareness of the opportunities, features and functionalities available through the World Wide Web, organizational norms, knowledge, and resources constrain their ability to instantiate these in their websites. Moreover, structuration models of technology provide a useful approach for future scholarship on the cultural production practices of social movements.

The Structuration of Websites

This study focuses on how environmental groups construct their own websites, and the organizational factors that condition these practices. Websites implicate several aspects of technology, which I understand as a multi-tiered and fluid concept that has three conceptually distinct dimensions. Generally speaking, technology may refer to specific material artifacts or objects, the social and cultural practices that surround them (including skills, knowledge, forms and formats), and the broader social arrangements and institutions (law, regulation, and industrial practices) that likewise influence their development, implementation, and use (Lievrouw, 2006: 246). In this study, my chief concern is with the social and cultural practices surrounding website production, and how the needs and interests of environmental groups condition these practices. For this purpose, I draw on structuration theory, which elucidates the mutually constituting roles

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of individual agency and structuring social practices in the shaping of both technology and social life. In the remainder of this section, I offer an overview of structuration theory and structuration models of technology, paying special attention to the organizational contexts of technology use.

Structuration theory, which considers the conditions or relations governing the continuity of social structures, overcomes accounts of social processes that attribute the power to act (agency) too closely to either autonomous individuals or determining social structures (Giddens, 1984: 25). Structuration theory posits a duality of structure in which human agents both influence, and are influenced by, the structural properties of the social practices and systems they help to create and maintain. Individuals can reflect upon and try to change ongoing social practices experienced in daily life, and their knowledge of these practices is evident both in what they have to say about their actions (discursive consciousness) and in their actions themselves (practical consciousness) (Giddens, 1984: 4). At the same time, rules and resources that structure social practices across time and space, as happens in the context of organizations, influence human agency, understood as the power to do or transform things. Rules are the techniques and generalizable procedures that individuals apply across various contexts; people can codify them in writing or informally adopt them as the routines and norms of daily life (Giddens, 1984: 22). Resources are the routine mechanisms that enable people to act. Allocative resources give people transformative capacity through their use of material objects and goods; and authoritative resources, through their command over other people (Giddens, 1984: 33). Structuration theory also involves the study of power. Power inheres in the rules and resources embedded in ongoing social practices, and these power-conveying mechanisms

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are the tools with which actors construct and reconstruct social life and structures (Giddens, 1984: 18). While Giddens (1988: 214) chief interest is in the reproduction of social systems, he also views these concepts as relevant to understandings of cultural production.

Orlikowski (1992) draws on Giddens to develop a structurational model of technology that further explains how organizations condition technology use. For Orlikowski (1992), the role of technology in any given context results from the ongoing interplay of the structures embedded in the technological artifact and the interpretations and actions of designers and users. She posits a duality of technology that highlights the iterative relationship between structure and individual agency with regard to technology, and allows for the analytical distinction between actions affecting and affected by technology. In fact, she divides these actions into two conceptually distinct though interrelated modes, that of design and use. While technological design conditions use, users have varying degrees of flexibility in how they interpret, appropriate, and utilize different technologies. Of course, in the context of organizations, this process is *doubly structurated*, since structuration occurs between both individuals and organizations and between individuals and technology. Within organizations, the interplay of people's experiences, interests, and motivations and the broader organizational conditions, such as intentions, norms, knowledge, strategies and resources (including time, money and skills), shape individual's power to act (Orlikowski, 1992: 411). In their relations with technology, individuals subject to these factors further interact with the structuring aspects of technological artifacts, conditioning the social practices, forms and functions surrounding technology use within organizations.

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This study draws on the analytical terms and distinctions delineated by structuration theory to study how broader organizational conditions influence the forms and functions of cultural production among environmental movement groups. Namely, I investigate what webmasters have to say about both their own actions within environmental groups (their discursive consciousness) and the resources and rules involved in their website production. With respect to websites, environmental groups are both users of software applications and distribution technologies, and active designers-in-use of web-based content, features and functionalities. The malleable aspects of computer technology, including its ability to manipulate symbols and its open-ended design, make this technology especially receptive to interpretive flexibility on the part of its users (Orlikowski, 1992: 421). In the next section, I examine how the aims, interests, and resources of national environmental groups affect their interpretation and use of their own websites.

The Study

I aimed to include a census of national environmental groups in the study. After compiling a list of national environmental organizations from the *Encyclopedia of Associations*, *The Conservation Directory*, and the *Website Source Book*, research assistants examined organization descriptions and web pages to verify their status as environmental movement groups with an orientation toward public membership or support (as opposed to groups with closed memberships or no stated public orientation). I

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defined environmental groups as those participating in sustained collective action and challenging prevailing authorities in order to advance environmental interests and goals (Castells, 2001; Tarrow, 2005) and presumed that groups oriented toward the public had greater incentive to use the Web as a communication tool. Our search yielded 108 groups.

Using contact information found on their websites, interviewers attempted to contact the webmasters, or person in charge of the website, by email and phone in order to request a telephone interview. Interviewers described the study to possible participants and indicated that all interviews would remain confidential. Interviewers scheduled interviews with agreeable respondents and sent several follow-up invitations to those who did not respond. Ultimately, interviewers conducted 26 telephone interviews with webmasters, and 2 webmasters elected to fill out identical questionnaires online. After receiving training in interviewing techniques, interviewers participated in a practice interview with a webmaster not included in the study. Formal interviews, approximately 30 minutes in length, were conducted in November and December of 2008.

Given how little is known about social movement communication over their own media, I did not attempt to hypothesize and test explanations for environmental group behavior. Rather, my research questions pursued a more open-ended examination of the conditions and relations structuring these groups' productions. Simply stated, how do environmental groups think about their own websites, and what rules and resources influence website production? The interview instrument had four parts. The first part collected biographical information about the webmasters, including their position, experience, and views on the Web as a communication tool. Part two focused on their organization's goals for web-based communication, their sense of efficacy in

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accomplishing those goals, their website's intended audiences, and the positioning of their websites within their overall communication strategies. Part three centered on the resources devoted to website production, including personnel, technical hardware, infrastructure access, time, training, and costs. It also asked about the perceived impact of their websites, including information on webmetrics (data on number of visits to their sites, page views, high traffic pages, and minutes spent on the site), and whether the web pages increased donations or membership. Part four asked about broader organizational practices, including their primary activities, their overall organizational resources, and their other communication practices and strategies. Semi-structured interviews, containing both open and closed ended questions, allowed for the collection of both exploratory and comparative data.

My analysis of the data utilized both a constant comparative technique and a structural approach. I used the constant comparative technique to analyze open ended questions, assigning responses to categories, identifying thematic relations between them, refining and combining categories, and integrating them into a coherent theoretical structure (Wimmer & Dominick, 2006: 117-8). I then analyzed categories developed through this technique using additional concepts and categories drawn from structuration theory. Thus, my analysis of environmental website practices focuses respectively on the webmasters' experiences and perspectives, organizational norms and strategies, organizational resources influencing website production, and reflexive monitoring of the success of these practices.

The twenty-eight environmental groups from which my respondents came reflected the heterogeneity of the environmental movement, varying widely in terms of

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their primary activities (Table 1), budgets (Table 2), and staff and membership size (Tables 3 & 4). While most webmasters described their groups as having more than one primary activity, the vast majority saw their groups as engaged in public education and coalition building. Roughly half indicated their group's orientation toward advocacy, research, protest, and campaign mobilization, and a smaller number identified their group as a legal advocacy or service organization. While budgets varied widely, the average budget for the groups ranged between 500,000-1,000,000 dollars. Between them, the organizations averaged 7 part-time and 58 full-time staff. However, 5 organizations had full-time staff numbering in the hundreds, which somewhat inflated this number. Many of the organizations also worked with part-time volunteers, the majority utilizing under ten volunteers per year. Seventy-one percent of the organizations had official individual memberships, and of these a quarter had between 101-1,000 members, while somewhat more than a quarter each had between 1001-10,000 members or 10,001-100,000 members. The remainder had over 100,000 members. Of the thirty-six percent that had group members, the majority had up to one hundred group members, while the rest were evenly split between 101-1,000 group members or 1001-10,000 group members.

[Insert Tables 1-4]

Webmasters' Experiences and Perspectives

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Initially, interview questions focused on webmasters' experiences and perspectives, as well as their thoughts about the strengths and weaknesses of websites as a communication medium. The term webmaster refers to the person in charge of, or responsible for, the organization's website. While all of those interviewed were the de facto webmasters of their organizations, only a handful of the interviewees had the job title of webmaster or web developer, and the majority of these simultaneously held other titles related to communication or development. Several organizations assigned website responsibility to their communication directors or coordinators, and some to directors of online services, development or marketing. In a few cases, project or program managers acted as webmasters. In a quarter of the organizations, the webmaster role belonged to the executive director or president of the organization. Less than half of the webmasters had prior experience with website creation, development or design. For a handful, their experience was mainly as writers or content providers for websites belonging to print publications, small companies, and political organizations. The rest had varying degrees of experience with web development and design, including HTML programming, application development, and personal and organizational website creation and management.

Interviewers asked webmasters for their opinions about how well or poorly suited the Web is for activities related to their organizations. Although these questions were open-ended, their answers clustered around several thematic categories related to communication goals and to the web's capabilities as a medium. Many webmasters saw the Web as a good medium for providing information, mobilization and resource generation. They viewed the Web as a means to disseminate detailed information on

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environmental campaigns, issues and causes, and as a repository for documents, newsletters and other educational materials. Respondents described it as a resource for ‘informing interested parties and the general public about our cause,’ ‘communicating significant background on issues,’ and ‘storing documents that can be downloaded and distributed’ (R14, November 13, 2008; R1, October 29, 2008; R15, November 12, 2008)

Several respondents associated providing information with establishing the organization’s identity and credibility. Having a site that publicizes who they are and what they do, what one respondent referred to as the ‘brochure function,’ allows interested parties to find them, helps develop the organization’s identity, and increases their credibility with various constituents, including potential funders and supporters.

Webmasters also saw the Web as useful for mobilization, allowing ‘opportunities for our constituencies to take action’, ‘mobiliz[ing] people to speak out on the issues,’ and ‘organizing advocacy’ (R5, October 16, 2008; R13, October 9, 2008; R27, October 8, 2008) Some used the terms ‘e-activism’ and ‘online activism’ to refer to web-based mobilizing features like receiving action alerts, sending comments to congress, signing online petitions, and peer to peer organizing. Several also cited the provision of databases and guides containing information about endangered plant and animal species, consumer products, and scientific and legal articles as tool that could mobilize activists, experts, and consumers around environmental objectives. For example, two of the groups offered shopping guides with information about environmentally friendly and unfriendly products designed to influence consumer behavior. One group pressured companies using environmentally unfriendly materials to discontinue their use by publicizing their names online.

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Many respondents said the Web was also critical to resource generation, seeing it as a tool for ‘marketing and development,’ ‘revenue generation,’ or ‘individual fundraising.’ For many, the Web provides opportunities to recruit new members and supporters, generate online donations and merchandise sales, and encourage media and press coverage. In addition to serving these goals, webmasters valued the medium’s immediacy and its ability to reach multiple audiences. They saw the Web as a means for the timely provision of up-to-date news and information, and for conveying targeted information to multiple constituents, including the public, the press, decision-makers, lawmakers, and existing and potential supporters.

The weaknesses of the Web as a communications medium, according to the webmasters, involved its deficiencies with respect to some communication goals and audiences. For example, some said the Web wasn’t a suitable means to present all types of information. As one group noted, ‘We do scientific and economic research. It’s difficult to convey the depth of that research on the website’ (R27, October 8, 2008). Moreover, many believed the Web is not suited to all forms of mobilization. For some, mobilization required building personal relationships, connections, and a sense of community that necessitates the co-presence of bodies or voices in time. The Web could supplement, but not supplant, the requirement of real-time interaction. The webmasters cited a number of activities as requiring in-person or telephone communication, including introducing people to an issue, organizing meetings, connecting to local organizations and initiatives, and showing people how to accomplish particular actions. Close to a third of the webmasters felt the Web is poorly suited to resource generation and fundraising, including cultivating donors and funders, enlisting volunteers, and recruiting new

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members. A couple respondents said their organizations relied on foundations, rather than individuals, for the majority of their funding, and that websites were therefore an unlikely source of fundraising. Another saw the Web as a limited outreach tool, since members of the public were unlikely to come across their website without specifically searching for them online. Finally, some webmasters suggested that the Web was not the best medium to reach some constituents, including those who are not ‘technology savvy’ or who prefer to access materials in printed form. One webmaster stated, ‘We probably get a lot more traction ... from the paper journal than from the electronic publication.’ (R26, October 7, 2008)

Organizational Communication Goals and Strategies on the Web

Interviewers also asked webmasters about their organization’s actual communication practices, including their estimations of the importance and success of particular communication goals on their websites, what else they would like to do on their websites, the role of the Web in their overall communication strategy, and their intended audiences.

Interviewers began by asking interviewees how important various communication goals were to their organizations, whether they were successful in achieving these goals, and what reasons they attribute to any lack of success. Alternative media studies, with its focus on social change-oriented communication, provided a typology of social movement communication goals that I incorporated into the interview (Stein, 2009a). These goals included providing information, resource generation, action and mobilization, lateral

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linkages, interaction and dialog, and creative expression. Interviewees indicated that their organizations prioritized these communication goals differently (Table 5). When asked whether providing information was very important, important, or not important to their organizations, the interviewees unanimously agreed that it was very important. Resource generation and mobilization were the next most emphasized communication goals. More than two-thirds of the webmasters rated resource generation, and more than half rated mobilization, as very important. A quarter or fewer considered these goals to be merely important. Roughly three-quarters of the webmasters attributed some importance to making lateral linkages and interaction and dialog, but only a third considered the former and a quarter, the latter to be very important. Finally, creative expression was the least emphasized communication goal, with a little over a third of the webmasters calling it important; and only a couple, very important.

[Insert Table 5]

Interviewees also recognized that their organizations were not always successful in achieving their stated communication goals (Table 6). While all twenty-eight said providing information was very important, only slightly more than half felt they were successful, and a third, very successful in realizing this goal. Resource generation, the second most important goal overall, fared more poorly. Half considered their websites successful at resource generation, but only a couple called them very successful. Close to half said they were unsuccessful. For mobilization, the third most important goal overall, over half said they were successful, but only a few said they were very successful.

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Webmasters considered their groups the most successful at linking, with half calling their groups very successful and somewhat less than half, successful. Interaction/dialog and creative expression were relatively low priorities. While twenty webmasters rated interaction/dialog as important or very important, none considered their websites very successful and three-quarters said they were unsuccessful in realizing this goal. Likewise, only twelve webmasters assigned some degree of importance to creative expression. Of these, the majority said their groups were successful, and a minority said they were unsuccessful, in meeting this goal.

[Insert Table 6]

When asked why their websites fell short of some goals, webmasters tended to identify one of three reasons: insufficient organizational resources, low prioritization of these goals, and perceptions of websites as inadequate for meeting these goals.

Webmasters commonly cited a lack of adequate resources, including time, money, knowledge, expertise, staff, hardware and software, as obstacles to providing information, resource generation, interaction/dialog and creative expression. For example, according to many webmasters, scant resources made writing content for the Web a low organizational priority, hampered efforts to design more interactive and creative websites, slowed the integration of offline and online databases, and prevented the implementation of a dedicated fundraising model on their sites. Some felt that while resource generation and creative expression are priorities within their organizations, their groups lacked a focus or dedication to these objectives in their websites practices. One

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webmaster suggested that insufficient resources and organizational interest explained the lack of creative expression on his group's website.

We'd have to give ourselves a 'C' for use of the Web. The organization culture, being headed by scientist types, is more comfortable with a less creative face to the world. They like a plain vanilla wrapper. This is probably the same with other groups. So they have the same wrapper. The few that are headed by artistic types stand out--Greenpeace and Rainforest Action Network types. We are trying to get more creative, like implementing Google Earth embedded applications, but it's a ways out. The technology for some of the more creative types of things like flash and so forth, those are a much heavier investment of time. (R26, October 7, 2008)

Finally, many webmasters said their organizations view websites as an inadequate medium for resource generation and mobilization. In some cases, organizations saw face-to-face communication as more central to fundraising, email as a better mobilization tool, and online capabilities for activism as a challenge they had yet to meet. One webmaster noted,

We have tried to connect the online capabilities we have with the on-the-ground aspects required to truly mobilize people and that connection hasn't happened successfully yet. We simply haven't cracked it yet, nor do

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we know of a workable, repeatable, realistic plan that we could follow to do so. (R21, October 15, 2008)

The notion that their websites represented opportunities that they had yet to figure out or take advantage of was a common refrain.

Other factors that influence environmental website content and features are the Web's position within larger communication strategies and conceptualizations of audience. All of the webmasters said their groups communicated regularly with their supporters, and all but one considered their websites as a regular means of communication (Table 7). The next most common communication channels were electronic mail, electronic newsletters, and direct mail respectively, and about half of the groups reported regularly communicating through social network sites, printed newsletters and telephone. Moreover, about one third of the interviewees said websites are their organization's main communication strategy, using descriptors like 'keystone,' 'essential,' 'centerpiece,' and 'paramount.' For the rest, their websites are an increasingly important, though not primary, part of their communication strategy. These saw their websites as supplementing the use of other media. For many, their websites are a resource to which they can point people at the end of a telephone conversation or a printed article. In this sense, the Web is a repository for more detailed information and for ideas about how to take action. And many webmasters expect this role to increase as more people go online, as network speeds increase, and as environmental groups strive to reach younger audiences.

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[Insert Table 7]

All of the organizations had multiple primary intended audiences for their websites (Table 8). As one group noted, ‘We are an exceptionally broad organization so the list [of primary audiences] is long.’ (R21, October 15, 2008) However, the same held true for other groups. The majority of interviewees counted current members, supporters and journalists as primary intended audiences for their websites, with the next most targeted audiences being potential members, potential supporters and the general public. Over sixty percent directed their websites towards experts/professionals and other environmental groups; and a smaller number, towards government agencies. Other intended audiences included donors, allied organizations, teachers and students, civic and political leaders, corporate targets of social change campaigns, and Spanish speakers. In addition, a few of the groups grappled with how to customize or segment their websites to better serve their multiple intended audiences.

[Insert Table 8]

Finally, many webmasters, aware of their websites’ shortcomings, hoped to take greater advantage of them in the future. When asked whether there is anything they’d like to do on their websites that they are not currently doing, all but two webmasters answered in the affirmative. Many expressed their interest in making their websites more involving, interactive, user friendly, multimedia rich, mobile and accessible. Several expressed an interest in offering more interactive applications and features (like interactive blogs,

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games, publication forums, and social networking), more mobilizing activities (including syndicated email feeds, peer to peer organizing, zip code triggered letters to elected officials, and online petitions), more resource generation capabilities (including the ability to accept donations online, to maintain an online membership database, and to track how people use their site), and more creative multimedia content (such as more and better design, visuals, video, audio, podcasts, and maps). In addition, many said their organizations were in the process of fundamentally rethinking their website design and functionalities, both to take advantage of the new tools available through video sharing and social networking sites and to better integrate the Web into their existing aims and operations. One webmaster described this process as follows:

We've done a lot of work on rethinking communication strategy and how the website fits into it. We've evolved greatly in the last year--an evolution from a good place to put things (massive online file sharing device) to engaging people in more two-way communication and motivating people to communicate with each other. Staff wonder why we can't do what the Obama campaign does, though there's more involved than having a website to do that. We're trying to push people to think about what they can do with their website for their programs, like having online community-type activities and user generated content. All the new stuff takes a lot of time to support and do well. (R27, October 8, 2008)

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Indeed, many webmasters indicated that their organization's perspectives and practices were still in flux, and our interviews suggest that an organization's communication goals, perceptions of the Web as a communications medium, and access to resources jointly condition their website practices.

Resources Allocated to Website Production

In addition to webmaster perspectives and organizational interests and aims, the interview asked about the specific organizational resources allocated to website production, with an emphasis on human resources, time, training, money, and hardware. Many organizations devoted significant staff and staff time to website production. While a handful of groups relied exclusively on key staff members, professional writers or volunteers to create web content, the majority spread this responsibility across their entire staff with numerous staff members contributing content related to their specific areas of expertise and responsibility. On average, the organizations interviewed had 3.6 full-time and 1.3 part-time paid staff working on their websites, and less than 1 part-time and 1 full-time volunteer. The mean average weekly staff hours spent developing and posting website content was fifty-three, though this number varied widely by group. While the majority of groups spent less than thirty hours per week updating and maintaining their websites, six estimated that they spent more than sixty hours. Many updated their websites frequently (Table 9). Over half of the groups said they updated their websites daily, and more than a third updated them weekly. Only a few updated them less frequently, on a

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monthly or quarterly (once every 3 months) basis. Most commonly, they made updates to the home and landing pages (the pages to which search engine results most commonly linked), and many focused on the provision of up-to-date campaign news, action alerts, links, top stories, press releases, news clippings, newsletters and blog postings.

[Insert Table 9]

The groups also invested in training, expertise, hardware and software. Nearly two-thirds of the groups said staff and volunteers received some type of training in website production or content management, and several had contracted with outside companies to help them redesign their web pages. Website production also required investments in hardware and Internet connectivity. All of the organizations but one owned computers and subscribed to high-speed Internet connections. While estimates varied widely, the average yearly cost of maintaining their websites, including staff salaries, equipment costs, connectivity, training, and other related costs, were substantial. The mean average was \$124,000, though the median average ranged between \$10,000-\$50,000.

Webmasters saw organizational resources as placing limits on their website production. When interviewers asked what kinds of resources the organizations needed to better use their websites, webmasters frequently called for more staff, time, money, software, and development and design expertise. They said they needed more staff and staff time to generate content and information online, and in a couple of cases to oversee the website. One webmaster said, ‘When I asked people that question, they all laughed.

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We need staff and money' (R28, October 16, 2008) Another noted, 'If we can double our staff time, we can do a lot more with the Web' (R26, October 7, 2008) While a couple of interviewees attributed their website's shortcoming to an insufficient organizational focus or mandate, most cited money as the primary problem. One of the respondent's above linked deficient funds with deficient staff time, 'We need more funding because staff are already so overburdened, even if they do get training or have new software and hardware, they cannot use them because they don't have time' (R28, October 16, 2008). The same respondent said that inadequate finances have prevented them from updating their website.

We have had on the table a rebuild of this ancient website. This website is seven years old. It looks exactly like websites were made to look in 2000. For 3-4 years, we've had a rebuild on the table, and have had the money issue many, many times. At this point, we're going to take a smaller amount of money and do what we're calling a facelift—not changing any of the underlying technology, or adding administration tools, but just recoding the home page and inside pages to give it a more contemporary look. That's going to be a \$20,000 project rather than a \$200,000 project. Basically, we need more resources. (R28, October 16, 2008)

Several wanted more money to spend on web design, technical capacity, content management systems, systems integration, software analytics, and consultants with web development and design expertise. One said staff needed expert training 'to think broadly

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about what they might do with websites instead of having it be just a repository for files and documents they produce' (R27, October 8, 2008).

Finally, several of the groups had begun utilizing outside software and service providers, viewing these as a cheaper and more efficient route to achieving their desired communication goals and functionalities. A few of the groups were working with outside companies, including Green Media Toolshed, eTapestry, and Convio, who provide pre-packaged software and services designed specifically for nonprofits. Such companies offer nonprofits web-based tools and functionalities they can't easily or cheaply build themselves or find in software packages aimed at commercial businesses (Justice, 2003: 4). Developed for environmental nonprofits, Green Media Toolshed's services include access to a frequently updated database of media contacts, online tools that track and organize media related work, and website tools that create online press rooms and manage web-based campaigns and e-mail listservs (Green Media Toolshed, 2009).

Aimed more generally at nonprofits, eTapestry provides access to Internet-based software for fundraising and donor management (eTapestry, 2009). Convio offers software and services that enable nonprofits to accept and track donations, organize volunteers, plan activities and advocacy, and manage content and constituency communication online. Several other groups looked to social network sites, such as Flickr and Facebook, or to open source content management software like Drupal, to host or enhance their web-based content and functionalities. Many of these providers offer some or all of their services for free. Some groups said these providers allowed them to leverage existing tools and functionalities they could not build or maintain on their own and therefore represented 'bargains' and 'the biggest bang for their buck.'

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Monitoring Website Use

Interviewers also asked webmasters about usage patterns on their websites, and whether their sites had generated new members or donations. Fewer than half of the webmasters had information about their website's metrics or analytics. Interviewers asked those who did track web analytics how many unique visits or sessions (unique user visits over a set time period) and how many page views (requests for single files defined as a single page in log analysis) occurred at their websites over the last year. The average yearly number of visits/sessions for those who kept track was 1.4 million, and the average number of page views was 6.2 million. In addition, the average amount of time users spent on their websites, according to the thirty-nine percent of webmasters who responded, was 3.5 minutes. Interviewers also asked webmasters which areas of their websites had received the most traffic. While some referred to their web analytics, others had more informal impressions of what constituted their most popular content. Many said that their home page, about section, publications, and resources pages received the most user traffic. A few counted specialized databases, educational pages aimed at teachers and students, and 'take action' pages among the most viewed content. Finally, interviews suggest that on average about twenty-seven percent of new members joined these organizations through their websites over the past year, and that twelve percent of the donations these organizations received were made online.

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Agency, Power and Environmental Website Production

Structuration theory conceptualizes human agency, or the power or capability to act, as situated within larger social structures and practices. Our interviews with webmasters, the human agents who stand at the intersection of the needs, interests, routines, norms, available resources and communicative activities of environmental groups, help reveal how organizational processes place constraints on agency and condition the design-in-use of their websites. While webmasters' own perspectives on the best uses of websites were closely allied to their understanding of their organization's priorities, many acknowledged their inability to fully realize these priorities in practice. Additionally, webmasters identified a wish list of online activities, including interactive blogs, games, publication forums, social networking, syndicated email feeds, online petitions, online donations, online membership databases, web analytics, maps, and multimedia, that were not part of their organizations' immediate communication priorities. Moreover, webmasters' role in website production is both subject to constraints and a potential source of innovation. While cognizant of organizational aims and resource limitations, they sought to push and prod their organizations toward new uses of, and perspectives on, the medium. For example, several spoke of their intentions to move their organizations' websites toward more interactivity and engagement, but suggested a discrepancy between their individual intentions and their organization's actions and capabilities. In discussing future directions, one said 'We're either where I would like us to be or we're going to be very soon' (R1, October 28, 2008) while another noted that despite his plans to move

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toward more interactive and community-oriented features, the ‘question is how much they can and will end up doing’ (R21, October 15, 2008).

These interviews suggest that several factors constrain the power of webmasters and their organizations to expand their website production activities. These factors include organizational perspectives, norms, rules and resources. Many webmasters indicated that both they themselves and other members of their organizations, including website contributors and those in leadership positions, could benefit from new perspectives, new models, and outside expertise to reorient their thinking about their websites. For many, the ability to take advantage of new opportunities provided by social networking, video sharing and other engaging, interactive and creative applications requires revised perspectives and new knowledge on the part of those who authorize and enact website production. Webmasters attributed the failure to actualize such applications to organizations that ‘didn’t really try,’ had antiquated perspectives on communication methods, or didn’t possess the necessary focus, knowledge or expertise. Indeed, one webmaster longed for ‘a mandate from the board of directors for technology and web direction.’ (R4, November 13, 2008)

Website practices are also constrained by organizational rules, norms, and resources. Organizational norms and expectations, understood as organizational goals, informed routine website production. Webmasters saw their organizations as having communicative goals and strategies that prioritized providing information, resource generation and mobilization and de-prioritized linking, dialog, and creative expression. As content analyses of environmental websites has shown, their website practices largely instantiate this hierarchy of priorities (Stein, 2009b). In addition, the authoritative

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resources of prioritized staff activity and time, and the allocative resources of money, hardware, and software, also shaped website production. Webmasters saw these limited resources as affecting their ability to generate content, implement applications, and more successfully pursue their stated communication goals. One webmaster's words suggest how goals and resources can act in concert to condition website practice.

We've sacrificed sexy and fun for the primary purpose of the website which is to provide information as an online reference library, and also because we have to keep the website simple to have interns and volunteers, who come and go, update and maintain the website with their limited web skills. (R11, November 17, 2008)

For this webmaster, the goal of providing information and the need to rely on voluntary and variably skilled labor necessitated a simple website with limited functionalities. Overall, while webmasters understood websites to offer a range of opportunities for environmental communication, organizational knowledge, norms, and resources influenced their power to pursue these opportunities.

While organizational rules and resources clearly structure environmental website production, webmasters also possess autonomy and agency that could help transform their organizations' uses of technology. Webmasters' discursive understandings of website production correspond with the practical knowledge instantiated in their actual websites, but were not bound by these practices. Webmasters articulated the reasons for

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their website production activities, understood where their intentions differed from their actual capabilities, and reflected on the factors, preventing them from expanding their websites' forms, features and functionalities. These factors include insufficient resources, and priorities and perceptions of website production and use. Webmasters also articulated future uses and aims for their websites, ranging from new applications and tools to new goals and purposes, and thought strategically about the changes in organizational thinking and practice necessary to achieve these aims. In this sense, they also demonstrated reflexive knowledge of their situated practices, and this knowledge could eventually change organizational practice around website production. As Giddens (1984: 16) notes, the reflexive abilities of human agents can allow them to reciprocally exert influence over the social systems of which they are a part.

The interviews also suggest that environmental website production is in a relatively fluid and flexible period that allows more room for agents to transform its design-in-use. The role of websites is evolving within many of these organizations. Many are in the process of thinking through how best to use the Web, and trying out new and different uses, such as mapping or social networking. Technology scholars point out that while interpretive flexibility of technology is always present, it may be highest during early periods of technology adoption. According to Pinch and Bijker (2009/1987: 128), technological artifacts display more interpretive flexibility in their earlier stages, often reaching a point of stabilization later on when groups no longer question or challenge their interpretation or use. Over time, routine, habitual and rigid uses of technology can make it appear to be an objective, inflexible aspect of organizations (Orlikowski, 1992: 406), rather than a tool whose uses are subject to change. Although the developmental

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direction of environmental websites remain uncertain and the web may hold more potential for continuous interpretive flexibility than other technologies, examining these sites in what may be a formative moment helps uncover the tensions, forces and factors influencing how environmentalists think about and construct this communication medium.

Conclusion

A structuration model of technology calls attention to the context of technology design and use, and posits that different groups will use technology in different ways, according to their situated interests, perspectives, norms and resources. Although cognizant of the duality of technology, or the mutually constituting relations between human agents and social structures in the shaping of technology, this study focused on how the structuring properties of organizations condition their website production practices. Interviews with webmasters, agents who play a mediating role between organizational norms, resources, and website design-in-use, reveal that environmental website features and capabilities are closely tied to their organization's communication goals and strategies, their knowledge and orientation toward the technology, their authoritative resources of staff and staff time, and their allocative resources of money, hardware and software.

While environmental groups may indeed use the Web in new and innovative ways, these developments will not spring from the technological artifact into the organization. Several decades ago when consumer video cameras began to achieve broad

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diffusion, political economist Nicholas Garnham (1984) chided those who conflated access to video technology with access to a mode of communication. He argued that the television medium did not depend on access to the material artifact of video technology, but on control of broadcast frequencies and on significant economic resources. Garnham (1984: 65-6) pointed out that media production takes time, skill and motivation, as well as a vision of how that communications medium contributes to specific social situations. While Garnham's concern was the obfuscating effect that technology valorization had on a critical evaluation of its uses by powerful economic actors, my concern has been to prevent excitement over new technology from obfuscating the real opportunities and challenges new technology presents for social movement groups, those civil society actors who pose challenges to reigning power structures. Heeding Garnham's critique, I have shown how the social practices and organizational resources of national environmental groups help explain the constraints and limitations they face when utilizing this mode of communication.

The structuration model of technology provides a useful framework for further examination of social movement web use. This approach suggests that we should continue to investigate the role of human agents in shaping web practice, including web content producers, designers and advisors, and the organizational contexts in which they work. Ethnographic interviews and observations with those involved in website production, combined with capacity studies of the organizational rules and resources involved in production, will provide better and more nuanced accounts of the social construction of the Web as a medium. More in depth case studies would also be valuable in this regard. As Pinch and Bijker (2009/1987: 130) note, such studies reveal not only

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how rules and resources play out in specific contexts, but also how the socio-cultural and political positions of these groups affect their interpretations of technology. By conceptualizing web development and use as a mutually constitutive, multi-tiered and reflexive process, structuration theory offers the analytical tools necessary to better understand the potential of this medium for social movement actors.

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