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The Technological Development of Candidate Websites: How and Why Candidates Use Web Innovations

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Abstract

The Internet offers political candidates a new way to campaign. Part of the Internet's novelty comes from technological options not available in most other media. Candidates, however, must weigh various benefits and costs in using a given technological innovation. For example, technology that allows for increased interactivity between users may lead to a more stimulating website but it also has the potential to distract users from the campaign's central message. In this paper, we use data from 444 congressional campaign websites, over two elections, to examine how candidates approach Web technology. We also investigate the factors that lead candidates to either utilize or avoid particular technological features. We show that technological adoption is determined by both practical and strategic political considerations. Of particular interest is that the competitiveness of a candidate's race leads the candidate to use more sophisticated presentation technologies but less advanced interactive innovations, since these latter options interfere with the candidate's message.

"Just as the Internet has – for better or worse – profoundly changed the way our nation does business, we can expect it to change the way we do politics."

Emilienne Ireland and Phil Tajitsu Nash, Campaign Strategists (2001: 5)

The Internet has become a vital resource in American political campaigns. It provides candidates with unmediated and relatively inexpensive access to voters while technological innovations continually offer new avenues for communicating and presenting information. Candidates now have the opportunity to create websites with features such as multiple media, personalized information, and even two-way communication. While these innovations seem promising, the decision to use them is far from automatic. Candidates must carefully weigh practical and political considerations before incorporating new technologies into their websites because each innovation has both advantages and drawbacks.

In this paper, we investigate how and why political candidates use a host of emerging Web technologies. Prior research has tended to focus on a single campaign and either offered a rich description of the technologies used on a small group of sites (e.g., King 1999; Cornfield 2004; Bimber and Davis 2003) or focused on a specific feature found across a wider sample of online campaigns (e.g., Dulio, Goff, and Thurber 1999; Schneider and Foot 2002; however, see Foot and Schneider 2006). We take a more comprehensive approach by exploring multiple technological features found across a large and representative sample of congressional campaign websites over two elections. Specifically, we analyze 444 U.S. House and Senate candidate websites from the 2002 and 2004 campaigns. Our investigation focuses on the extent to which candidates have taken the opportunity to move beyond what has been called the "electronic brochure"

format by incorporating various presentation (e.g., video, audio) and interactive features (e.g., personalized information, two-way communication).[1] This provides insight into how candidates approach technology and balance the various costs and benefits associated with each innovation.

We then examine the conditions that motivate candidates to use emerging technologies by supplementing our Web data with detailed information on candidates, races, and constituencies. We investigate how the decision to use certain features is affected by things like available resources (e.g., campaign funds), increased ease of using technologies (e.g., developments over time), demand effects (e.g., voter constituency), and strategic dynamics (e.g., race competitiveness). Considering both practical and political motivations provides a clearer picture of when candidates will use certain technologies and when they will avoid them.[2]

We start in the next section with an overview of campaigning on the Web. We then discuss how and why candidates might use Web technology before describing our data collection and reporting the results of our analysis. We end with a brief conclusion that highlights our principle findings.

Campaigning on the Web

In less than a decade, it has become virtually mandatory for candidates to have a campaign website. In 1998, only 35% of major-party House candidates and 72% of

[1] The concept of an "electronic brochure" has been used in other studies including Kamarck (1999) and Foot, Schneider, Xenos, and Dougherty (2003).

[2] Although there are some similarities, our approach is sufficiently different from that of Foot and Schneider (2006: 157-186). Most notably, we conceptualize technological features more specifically and focus our analysis on them which differs from Foot and Schneider's broader examination of "informing, involving, connecting, and mobilizing" practices. Moreover, we examine the motivations for using distinct technological features rather than broad categories of features such as "informing" or "involving" practices.

major-party Senate candidates posted campaign websites (Kamarck 1999: 100). By 2004, these numbers had jumped to 81% and 92% respectively (Goldsmith 2004; also see Foot and Schneider 2006: 7-11), leading some to suggest that "The question is no longer whether candidates for major office will have a web site, but what the web site will look like and how it will be used" (Williams, Alyesworth, and Chapman 2002: 43; also see Williams 2003).

Campaign websites have also become more widely used and there is some evidence to suggest that they are affecting voters and, thus, election outcomes. Williams (2003: 4) calculates that individual Senate candidate websites, for example, received between 1,000 and 800,000 visits in 2000 while just two years later the number of hits ranged from 6,854 to 1,615,819.[3] Multiplying these visitation statistics with the number of candidate websites that now exist, and noting that website visitors tend to be quite politically active (e.g., Norris 2004), one gets the sense that online campaigns may have notable political influence that is sure to grow. Moreover, candidate websites undoubtedly affect many more voters indirectly through activists who disseminate information (see Foot and Schneider 2006: 86 and 129-155; Gordon 2006) and, perhaps most importantly, journalists who frequently visit these sites to gather material (see Ireland and Nash 2001: 14-15; Schneider and Foot 2002).

The Web's growing prominence in American political campaigns affects candidates who must decide how to use this relatively new medium and the emerging technologies it offers. It is important to understand how candidates make these decisions because the technologies they select will ultimately affect how voters and journalists

[3] Williams' numbers include both major-party and third-party Senate candidates.

receive and process campaign information.[4] Indeed, online campaigns provide an intriguing venue for analyzing the interaction between candidates and observers.[5] In the next section, we draw on campaign and information processing research to explain some of the reasons that candidates might have for using or avoiding technologies given their presumed effect on website visitors.

Website Technology

To gauge the extent to which candidate websites utilize emerging technology, we examine if they incorporate features that would be impossible to include in a single, static paper brochure. This approach has been used by others (e.g., Kamarck 1999; Foot, Schneider, Xenos, and Dougherty 2003) although we clarify the "electronic brochure" standard by investigating whether or not candidates are using particular *presentation* and *interactive* features. The specific presentation features include multimedia content and display options while the interactive features include personalization functions, external links, and two-way communication. In constructing their websites, candidates will have to make strategic choices on each of these dimensions which will be based, in large part, on each innovation's perceived costs and benefits.

[4] For example, Lupia and Philpot (2005) show that visitors are most affected by websites that present information in a way that is consistent with the visitor's tastes.

[5] Studying candidate websites also enables researchers to gain a better understanding of campaigning more generally because campaign websites are unlike debates or ads in that they are used by nearly all candidates and offer an unmediated composite of a campaign, thus giving a complete view of the campaign's messages.

Presentation

The Internet offers a platform to bring together multiple forms of media which help to present information vibrantly. Audio sound, for example, enables candidates to personalize and highlight certain information. Similarly, candidates who opt to include dynamic visuals, such as videos, likely do so in order to draw the audience's attention to the display (Graber 2001) and possibly to accentuate perceptions of the candidate's personal qualities (Keeter 1987; Druckman 2003). Multimedia features can make a candidate's website more engaging but they also require some technological skill and available resources, albeit not much. Moreover, audio and video have the potential drawback of distracting visitors from important information found in the text. In this way, moving beyond an "electronic brochure" may work against ensuring that key messages are clearly received.

Candidates must also make decisions in terms of display options such as the amount of information provided and the extent to which it is updated. The Internet is virtually limitless in terms of providing information, and a frequently updated website allows candidates to get their message across and keep visitors interested so that they might return. In fact, Davis (1999: 116) notes, "A website that never (or only infrequently) changes will be visited once or twice and then abandoned. Voters will not return unless they believe that something new has happened" (also see Cornfield 2004: 26-27; Bimber and Davis 2003: 127-130). However, providing too much information can clutter the website and make it hard to navigate while candidates must also consider the effort and expense associated with updating multiple pages of information (see, e.g., Cornfield 2004: 25).

Interactivity

The Internet also provides for interactivity which enables users to actively engage the campaign and/or other users online. Stewart, Pavlou, and Ward (2002: 368) state that "perhaps the most interesting and novel attribute of the new media is their capability for interactivity, which is becoming increasingly more pronounced with the infusion of more-advanced communication media" (also see Tedesco 2004). Interactive features can engage users by granting them control which stimulates attention and learning (e.g., Southwell and Lee 2004: 645), although the attention may not be focused on the exact information the candidate prefers (Eveland and Dunwoody 2002).

Personalization is a form of interactivity in which the user can personalize their engagement with the campaign through the website. Users may be given the opportunity to take a quiz, provide information, or move information around to suit their personal preferences. Candidate websites can also engage users through targeted marketing. Specifically, the website can solicit personal information from the user (e.g., zip code, political leanings, attitudinal measures) and then send crafted messages designed for specific segments of the population. For example, if a user enters that he or she views education as the most important campaign issue, then the website could automatically produce messages about education (see, e.g., Cornfield 2004: 42; Stewart, Pavlou, and Ward 2002: 368-369). All of these personalization features allow users to customize their interaction with the candidate's website. While personalization often enhances the persuasiveness of the candidate's message (O'Keefe 2002: 245-246), it can also create segments of incompletely informed voters who learn less about other aspects of the

candidate's message (Chadwick 2006: 8). Personalization features can also be challenging to incorporate as the technology is relatively new. Ultimately, personalization goes well beyond an "electronic brochure" by actively engaging users but it may also lead to a less coherent understanding of the candidate's goals and intentions (Stromer-Galley 2000).

The tradeoff between information control and interactive engagement arises to an even greater extent when it comes to providing external links. Users who enjoy freedom to explore will likely be more engaged with the site although links also allow for more selectivity and limit the control over what specific information the audience will access (see Tewksbury and Althaus 2000: 458; Foot, Schneider, Dougherty, Xenos, and Larsen 2003). Of course, this also depends on exactly where the links lead. For example, links to voter registration websites and news articles that the campaign has carefully selected are relatively safe in that the content is highly predictable and visitors are likely to return to the candidate's site (Foot and Schneider 2006: 59). However, links to a political party or presidential candidate are much riskier because the campaign has no control over the information presented there and it may not be entirely consistent with the candidate's message (see Davis 1999: 101). External links are easy to incorporate but candidates will have to think carefully about each individual link and its potential effect on website visitors.

Web interactivity involves not only content but also the possibility of communication between the website and its users, and/or between users themselves (what Bucy 2004 and Kaye and Johnson 2006: 149 call *interpersonal* interactivity). Communication through features such as message boards, forums, and live chats can

certainly stimulate attention and enhance the likelihood of forming "online communities" which, as Howard Dean's presidential campaign showed, can have numerous benefits (see Trippi 2004; Tedesco 2004: 515; on persuasion and interactivity, see Stromer-Galley 2000; Stewart, Pavlou, and Ward 2002; O'Keefe 2002: 257). However, these features, again, allow for less control over the flow of information, require strong logistical capabilities, and may, in fact, be more technologically interesting than politically useful (see Davis 1999: 115). At the end of the day, these interactive innovations, while interesting, may still be too complex for wide use.

New presentation and interactive technologies continue to develop and many of them seem to have exciting political applications that enable candidates to move beyond the static "electronic brochure" format. However, each new innovation has tradeoffs that the candidate must weigh. In some cases, the innovation may still be rather complicated so that only certain candidates can think about using it. In other cases, the tension is between retaining control over the message that visitors receive and the desire to develop an engaging website that stimulates interest and support. All of these are important considerations for any campaign although, as we will discuss in the next section, there are likely factors that motivate candidates one way or the other.

Explaining Technological Choices

There are various possible determinants of the technological choices that candidates make for their websites. Indeed, candidates must consider both practical and political issues in making these decisions. For example, candidates need to think about the technical ease of using certain technologies as well as their cost, demand, and the

political price they may exact. In this section, we elaborate on these considerations and discuss how they might affect choices to use emerging technologies.

Technology generally becomes easier to use with time. Improvements and advancements allow candidates to at least consider incorporating features that may have once been too complex. Therefore, time itself may be a determinant of using particular tools that were once considered complicated like multimedia, personalization features, and two-way communication. For those elements that have always been quite simple (e.g., external links, display options), time ought not to be much of a factor (e.g., Foot and Schneider 2006: 158).

There are also a number of candidate-level variables that could affect decisions about technology. To begin with, well-funded candidates may be more likely to use certain technologies – particularly those that are more complicated – because they can afford to pay for developing a sophisticated website. Conversely, candidates with limited campaign funds may wish to spend their money on things other than website technology (Bimber and Davis 2003: 27). The candidate's party, gender, and incumbency status may also influence technology decisions although expectations for each are not entirely obvious. It may be the case that one party is more technologically savvy than the other (Puopolo 2001: 2034)[6] and that gender and incumbency matter in the sense that they generate different approaches to campaigning more generally (on gender, see, e.g., Kahn 1996; Gulati and Treul 2003; Puopolo 2001: 2039; on incumbency, see, e.g., Fenno 1996).

[6] After analyzing Senate candidate websites in 2000, Puopolo (2001: 2038) claimed that "Republicans win the title of 'Most Web Savvy'."

Differences in the office level being contested may also factor into the extent to which candidate websites go beyond the "electronic brochure" standard. Compared to House candidates, Senate candidates typically have larger constituencies and staffs which could, all else equal, incline them towards more technologically sophisticated sites (see, e.g., Dulio et al. 1999; Bimber and Davis 2003: 26-27). In fact, a larger staff may be particularly helpful with some of the more intricate features while a more diverse constituency may encourage Senate candidates to pay greater attention to personalization features.

At the district level, certain demand effects may influence candidates' decisions about technology. Income and education could be particularly important as wealthy and well-educated districts tend to have more access to the Internet and thus greater familiarity with certain technologies (see Bimber and Davis 2003: 104-107; Foot and Schneider 2006: 171).[7] Candidates from districts with presumably less Internet acumen may not feel obligated to have complex sites or may, in fact, try to present simple sites to ensure their message reaches the intended audience. Partisanship in the district (e.g., percentage of Republicans / Democrats) is an obvious political consideration that might also affect decisions about technology in that Republicans tend to be slightly more active online (Pew 2000).[8]

[7] Foot and Schneider (2006: 171) suggest, "to the extent that political campaigns gauge their Web campaigning strategy on the basis of their target electorate's use of the internet, both family income and level of education serve as reasonable proxies for these factors."

[8] According to Pew (2000), "more Republicans than Democrats went online for election news (37% of Republican online users vs. 34% of Democrats)…. Republicans hold a clear advantage in online activism over Democrats, measured in terms of interactive participation. More GOP consumers of online election news reported sending or receiving e-mail supporting or opposing a candidate (29% to 20% among Democrats); Republicans were also more likely to participate in online polls (39% to 31%) and more likely to contribute money through candidate websites (6% to 3%)."

In terms of strategic political considerations, race competitiveness could have an important role to play in decisions about website technology. As races tighten, candidates must think more about the consequences of their decisions and try to stimulate voters while retaining control over their message. Technologies that do not severely compromise message control (e.g., multimedia, display options) should be most commonly used in tight races where candidates have an incentive to employ features that make their websites more vibrant and engaging. Conversely, technologies that sacrifice message control (e.g., personalization, external links, two-way communication) ought to be negatively associated with race competitiveness because candidates in tight races need to ensure that their message is clearly articulated and understood. For candidates in close races, message clarity may trump the extra stimulation that these features provide (see Foot and Schneider 2006: 172). Ultimately, race competitiveness may be a key factor in determining which technologies candidates use and which they avoid.

In thinking about website technology and the degree to which they want to move beyond the "electronic brochure" standard, candidates will have to consider both practical and political issues. Candidates will obviously avoid technologies that are too complex or costly for them to handle. However, even if a technology is feasible, candidates must still think about the extent to which it is necessary and its potential tradeoffs. Some technologies may be easy to incorporate but are ultimately left out of the candidate's site because, for example, they are deemed superfluous or exact more political costs than benefits which builds on the assumption that candidates are risk adverse (Shepsle 1972). Ultimately, the decision to use each technology is likely driven by a host of considerations.

Data

To test these expectations about how and when candidates use Web technology, we examine data from an extensive content analysis of congressional candidate websites from the 2002 and 2004 campaigns. In each year, we identified every major-party Senate candidate website and took a random sample of major-party House candidate websites, stratified by region. A team of trained content analyzers then coded the sites, rendering a total sample of 444 candidate websites – 59 Senate and 116 House websites for 2002, and 67 Senate and 202 House websites for 2004.[9] Coders analyzed the entirety of each individual website and identified a vast series of political and technological indicators.[10] We then supplemented these Web data with information about the candidates, races, and districts.

Our five dependent variables, which capture the key presentation and interactive dimensions previously discussed, come from the Web coding data. To measure presentation features, we created a "Multimedia" variable that indicates whether the candidate's website included a video and/or audio file. We also measured display features; in particular, whether the site had more than one page ("Pages") and if there was information on the site that appeared to be updated ("New Info"). Our variable for "Personalization" features measures whether the site included any of the following options to personalize the visitor's interaction with the site: to take a quiz; personalize

[9] Details about the entire coding project are available from the authors. Our framework differs from other content analyses (e.g., Xenos and Foot 2005; Bimber and Davis 2003; Gulati and Treul 2003) in that it is more systematic, includes multiple years and office levels, and examines the entire candidate website rather than just the front page.

[10] To assess the reliability of the coding, we randomly sampled approximately 30% of the websites and had one of two reliability coders code these sites. Specific reliability statistics are available from the authors; in general, we found high levels of reliability, nearly always exceeding the .80 threshold (see Riffe et al. 1998: 131; Neuendorf 2002: 143).

information for targeted marketing;[11] arrange information; add quantitative data; and/or add qualitative information. Our second interactive feature measures the use of external "Links" to one of the following: the candidate's political party; a presidential campaign website (2004 only); a news outlet (2004 only); a registration website; and/or any other external site. We also focus specifically on the "Party Link" in parts of our analysis as the particular target of this link may be quite consequential and it was measured over both campaigns. Our final dependent variable measures the use of "Two-Way Communication" features as the existence of a live chat function, a candidate chat function, and/or a forum (i.e., message board).[12]

Our analysis relies on ten independent variables. Measures for "2004" (i.e., year), "Senate" (i.e., office level), "Democrat" (i.e., candidate's party), "Incumbent" (i.e., candidate status) and "Female" (i.e., candidate gender) are all straightforward dichotomous variables taken from *The Almanac of American Politics* where necessary. Our first district-level variable is "District Partisanship" which is based on the percentage of votes in the district (or state) cast for George W. Bush in 2004 as reported in *The Almanac of American Politics*. The district-level measures for "Income" and "Education" come from the 2000 Census. "District Income" is the average household

[11] Our specific coding instructions for "Personal" were: "On *any* part of the site that you examined, could you personalize the information, such that you would receive information *that may differ from what another web visitor would receive* (even if this would lead you to some other page; you don't need to examine this other page, but note its presence)? For example, you might enter your zip code and receive voting information, or something else specific to you (or people like you) such as information about an issue you care about. (Note this does *not* apply to information for general groups such as senior citizens.) The codes are: 0=no personalized information at all; 1=personalized information."

[12] Again, our web coding covered a host of other variables, including some technological measures such as one-way communication (e.g., email subscriptions, voter contact) and structural features (e.g., blinking, scrolling, graphic movement). However, we focus only on those technological features, with sufficient variances, that indicate the extent to which candidates are moving beyond the "electronic brochure" standard. Also, we do not include "blogs" as part of two-way communication because they had yet to really develop this capability by 2004.

income (in tens of thousands of dollars) in the district (or state) and "District Education" is the percentage of people in the district (or state) with at least a high school education. We measured each candidate's available resources with data from the Federal Election Commission on the amount of money each raised in millions of dollars. Finally, we used data from *The Almanac of American Politics* to create a race competitiveness measure. We took the difference in the vote totals from the winner and loser and then, following convention (Jacobson 1992: 33; Foot and Schneider 2006: 173), broke the races into thirds: "highly competitive", "mildly competitive", and "non-competitive".[13]

Table 1 provides descriptive information on the independent variables. Our sample includes 175 candidate websites from 2002 (39%) and 269 from 2004 (61%). A little over 28% of the sites were from Senate candidates, 46% were Democrats, 85% were incumbents, and 15% were female candidates. Average district-level income ranged from $34,962 to $109,760 with a mean of $54,053 while the percentage of the population in each district (or state) with at least a high school education ranged from 50.4% to 92.5% with a mean of 81.43%. Finally, the average candidate in our sample raised a little over 2 million dollars (2.03 million) while the average margin of victory was 29.42 points.

[Table 1 about Here]

[13] We do not use a continuous measure for race competitiveness because we do not expect slight differences to be meaningful. Dividing the measure into thirds follows convention (Jacobson 1992: 33) and facilitates interpretation. Highly competitive races have an average margin of victory of 10.6% (with a maximum of 20%) while mildly competitive races are between 21% and 35% (average is 29.1%) and non-competitive races have margins of victory larger than 36% (average is 52.4%).

Results on the Prevalence of Web Technology

To what extent have candidates moved beyond the "electronic brochure" standard by using emerging Web technologies? Table 2 reports the percentage of congressional candidate websites in our sample that utilized individual technological features. The results are broken into year and office level to provide further insight into possible trends.

[Table 2 about Here]

Table 2 shows that, in terms of multimedia features, 43.7% of candidate websites went beyond static presentations (i.e., only text, pictures, or graphics) to include dynamic content such as audio and/or video.[14] While nearly all candidate websites include pictures (97.3%) or graphics (87.2%) (data not in table), less than half of the candidates in our sample made their sites more stimulating and vibrant with video and/or audio files. This is somewhat surprising given the relative ease of using these features; however, the marginally significant increase between years (39% in 2002 and 47.6% in 2004: $z = 1.79$, $p = .0728$) and the robust difference between office levels (36.8% for House and 63.5% for Senate: $z = 5.25$, $p < .01$) suggests that usability and resources may be a factor in deciding whether to use multimedia technology or not. Moreover, the fact that well-funded Senate candidates are more likely to have ready-made audio and video clips for other venues might help explain why they use this technology more than their House counterparts.

[14] Six cases were excluded from this part of the analysis because coders were not using computers with audio capabilities and thus could not accurately measure the existence of audio features.

In terms of display options, we find that virtually all candidates have taken advantage of the Internet's limitless potential to provide information over multiple pages. In fact, 92.6% of all candidates in 2002 had multiple pages and by 2004 there was only one candidate (for the House) who offered a single-page website that would be virtually identical to a paper brochure (92.6% in 2002 and 99.75% in 2004: $z = 3.65$, $p < .01$). We also find that in 2004 (we did not code this in 2002 unfortunately) the majority of candidates (80.2%) made the effort to update information on their sites. The fact that Senate candidates (92.5%) were significantly more likely to do this than House candidates (76.1%: $z = 3.71$, $p < .01$) suggests that available resources may play a role in the decision to use this capability.

The results in Table 2 also show that, on average, one-quarter of congressional candidates incorporated some sort of personalized interaction feature on their websites (e.g., quiz, move content, targeted marketing). However, there are significant differences over time and across office level. Whereas only 18.3% of House and Senate candidates in 2002 used personalization features, 29.4% used them in 2004 ($z = 2.75$, $p < .01$) – a sign that they are getting more popular with time. Also, 32.5% of Senate candidates across the two campaigns used these features compared to 22% at the House level ($z = 2.19$, $p = .03$). Overall, the relatively low adoption rate could be primary evidence that most candidates want to shape the possible range of experiences that individuals have on the site and preserve the integrity of information they provide, in the context it was intended. However, the differences over time and across office levels could suggest that the use of personalized interaction features is being influenced by the increasing ease with which they can be used and the resources and objectives of Senate candidates who

may want to offer a more customized experience to visitors from their larger and more diverse constituencies.

A clearer dynamic that offers users more choice and thus the candidate less control over what users see is the availability of external links. Our results show that 72.7% of candidates provided external links. Moreover, there has been a statistically significant increase across congressional candidate websites from 2002 (65.1%) to 2004 (77.7%: $z = 3.61$, $p < .01$). Differences between House and Senate candidates, however, are statistically insignificant (73.3% for House candidates, 71.4% for Senate candidates: $z = .40$, $p = .69$). While the general evidence suggests that candidates are fairly comfortable with providing external links, further analysis indicates key differences based on where the links lead. Across 2002 and 2004, 44.2% of our House and Senate candidates provided links to relatively safe voter registration websites. Candidates in 2004 were equally likely (45.4%) to provide links to news sources, including links to specific articles or reports about the candidate. However, when it comes to the riskier links to party and presidential candidate sites, congressional candidates are much more hesitant. In 2004, only 15.2% of campaign websites linked to a presidential candidate site while 27.6% linked to their party's website in 2002 and 2004. This suggests that candidates take a calculated approach towards external links by providing "safe" links more frequently than potentially "risky" links.

Our results also show that congressional candidates have yet to fully utilize the Internet's potential for two-way communication. In the aggregate, only 9.2% of candidate websites had at least one two-way communication feature (i.e., live chat, forum, and/or candidate chat). While there was virtually no difference between levels of

office (9.4% for House candidates and 8.7% for Senate candidates: $z = .233$, $p = .816$), there has been a slight, albeit statistically marginal, increase from 2002 (7.4%) to 2004 (10.4%: $z = 1.10$, $p = 0.27$). Still, around 90% of all candidates have avoided any use of two-communication features on their websites. By not utilizing the Web's potential for two-way communication, candidates retain control over the messages found on their websites although they miss an opportunity to engage visitors in dialogue about the candidate and the campaign. Admittedly, two-way communication technology may have been difficult to implement in 2002 although by 2004 it would have been relatively easy for candidates to provide some sort of forum for two-way communication and/or discussion (e.g., forum, message board). The fact that this technology is still relatively underutilized suggests that the desire to control the message may be quite important for candidates (see Stromer-Galley 2000; Stromer-Galley and Foot 2002).

There are certainly signs that, by and large, congressional candidates are moving beyond the static "electronic brochure" standard, albeit with some hesitation. In terms of presenting information, a strong majority of Senate candidates and a growing segment of House candidates are incorporating multimedia features that make their sites more vibrant and engaging. Virtually all candidate sites have multiple pages and a very large proportion keep their sites fresh with updated information – something that would be impossible with a brochure. In terms of interactivity, there has been somewhat less progress with only a quarter of candidate websites utilizing personalized interaction features and less than 10% of sites offering venues for two-way communication. As for external links, candidates seem more willing to provide links to sources that may potentially help them (e.g., voter registration, news stories about the candidate) than to

websites where the candidate relinquishes control over the message (e.g., party, presidential candidate). This overall pattern of results suggests that candidates are indeed quite calculating when deciding about Web technology and tend to prefer features that make their sites more compelling without sufficient costs or potential for message distortion.

We have alluded to some of the factors (i.e., year and office level) that may affect the way candidates use Web technology. However, we now conduct a more robust test of the considerations that motivate candidates to embrace or avoid particular innovations. Table 3 presents the results of logistic regressions for the use of five key technical features mentioned above. We have excluded "Pages" from this analysis due to a lack of variation on that measure (96.8% of candidate websites had more than one page). In addition, Table 3 reports the results for "Party Link" instead all external links because the analysis above shows important differences between links based on where they go on the World Wide Web.

Results on the Motivations for Using or Avoiding Certain Technologies

The first column in Table 3 shows that using multimedia to present information – namely, with audio and/or video – is a function of both practical feasibility questions (e.g., time, available resources) and political motivations (e.g., race competitiveness). The fact that multimedia use increased from 2002 to 2004 reflects the growing availability of this technology while its positive association with funds raised further suggests that feasibility issues are at play.[15] It is a little surprising to see that multimedia use is significantly associated with Democratic candidates given that Republicans have

[15] Similarly, "Senate" has a nearly significant association with multimedia use ($p = .106$).

been described as more "web savvy" in the past (Puopolo 2001: 2038). We also find multimedia use is associated with district-level education which is a demand feature that presumably reflects the need to appeal to a more sophisticated electorate that is likely to be online. In terms of purely political motivations, we find that multimedia use increases with race competitiveness which is a clear indication that, as races get closer, candidates look to utilize technologies that can make their sites more vibrant without exacting large resource or message distortion costs.

[Table 3 about Here]

To understand how candidates think about displaying information, we analyzed the factors associated with updating candidate websites in 2004 (updating was not measured in 2002). Here, again, we find both practical feasibility and political motivations at work. Specifically, the decision to keep a candidate's website fresh and dynamic is driven by office level and race competitiveness. The fact that Senate candidates are more likely to update than House candidates suggests that large staffs can better handle this time-consuming chore and that Senate candidates may feel a stronger need to provide current information to their larger and more heterogeneous constituencies. While other candidate characteristics and demand effects are insignificant predictors, we again find that race competitiveness plays an expected role in the decision to update information. As races get tighter, candidates are more inclined to enhance their websites with features such as updated information that make their sites more interesting without jeopardizing message clarity.

Overall, then, in terms of presenting information on their websites, we find that candidates are influenced by both practical and political considerations. Feasibility issues (e.g., ease of using technology, staff size, and financial resources) are naturally important although we also find that there is a consistent political incentive to provide vibrant and fresh information that comes from race competitiveness. Ultimately, the inclusion of presentation features that go beyond the "electronic brochure" standard seems to be a function of both practicality and strategic motivations.

What determines the extent to which candidates use interactive technologies on their websites? In terms of offering personalized interactive features, we find that feasibility is a major consideration although race competitiveness seems to play a role as well. Our results show that these personalized interaction features grew more popular over time which clearly indicates that candidates warmed up to this technology as it improved and became easier to use. Again, Senate candidates used features like quizzes, moving information, and targeted marketing more than House candidates presumably because their larger staffs were better equipped to incorporate this technology and the fact that there might be a greater incentive to offer personalization features to a more diverse constituency. It is, again, difficult to explain why Democratic candidates use this technology significantly more than Republicans, especially given that Republican strategists have gained a reputation for effective targeted marketing. It is also important to note that we find a negative, albeit statistically insignificant ($p = .147$), relationship between race competitiveness and personalized interaction features which suggests that as races tighten, candidates are less likely to offer technologies that could interfere with the campaign's message. It seems that candidates in close races would have an incentive

to avoid features that allow visitors to personalize their interactive with the site – these candidates need, more than others, to ensure that visitors get a clear and uniform understanding of their positions and campaigns themes even if that means that the site is less engaging.

External links are another feature that can stimulate attention but also have potential political drawbacks. To get a sense of what motivates candidates to use or avoid external links, we focused on the determinants of providing a link to the candidate's political party website because this is provides a clear example of the tension that external links cause.[16] Table 3 shows that the decision to provide a "Party Link" is driven primarily by race competitiveness although candidate gender and district-level education also matter. Party links are provided fairly uniformly across elections, office levels, party affiliations, and incumbency status although female candidates use them more often than male candidates which speaks to their possible need to define themselves clearly to the electorate. While district partisanship and average income are insignificant, we find that district-level education is positively associated with party links which is consistent with a growing sentiment that more sophisticated constituents tend to be stronger partisans (see Wilson 2006). Again, however, we find that as races tighten, candidates shy away from features that jeopardize their control over the information that visitors will receive. Candidates in tight races have a greater need to ensure that visitors stay on their sites and are not distracted by visiting a party website, where the candidate has no control over what the visitor will encounter.

[16] Our logistic regression for "External Links" more generally found positive and significant associations with year ($p = .004$) and Democratic candidates ($p = .017$) while none of the other factors reached statistical significance. These somewhat inconclusive results are likely the result of the differences between external links in terms of where they take the visitor.

Finally, our analysis of the reasons candidates might use or avoid two-way communication features again highlights the importance of political considerations when deciding about Web technology. Results in the final column of Table 3 show that the use of two-way communication features like chats and message boards is driven by party affiliation, incumbency status, and race competitiveness. The fact that Democrats are more likely to offer two-way communication features may be the result of Howard Dean's success with these technologies in the 2004 presidential election. In terms of the negative relationship with incumbency, it may be the case that incumbents use two-way communication less because they have an established center for communication within their constituency and Capitol Hill offices. These results, once again, confirm the tendency that candidates in tight races have for relinquishing control over their website's central message, even if it means that the site will be less engaging.

The pattern of results reported in Table 3 is quite clear in that decisions about using Web technology have both practical and political components. Feasibility is a necessary precondition for using any technology and the results show that the use of each feature increases with enhanced feasibility whether by improved technology over time (i.e., 2004), having larger office staffs (i.e., Senate), or more available resources (i.e., funds raised). In terms of demand effects from the district, we find that the partisanship and average income in the district never matter although higher levels of education tend to be associated with more sophisticated websites. While demand effects generally play a secondary role in decisions about technology, strategic political considerations are consistently consequential. For each technology, race competitiveness was either a significant or nearly significant predictor. It was positively associated with using

presentation technologies that exacted few political costs while being negatively associated with using interactive technologies that jeopardized control over the campaign's message. Clearly, being able to include a technology is not enough; candidates must also have political motivations for going beyond the "electronic brochure" standard.

Conclusion

The emergence of the Internet has provided political candidates with a new way to campaign and technological innovations continually provide opportunities for candidates to connect with website visitors. While each new feature has its own potential benefits, it also has its own unique drawbacks that candidates must consider before using. By analyzing both presentation and interactive features on a large and representative sample of congressional campaign websites, we have shown that candidates have generally moved beyond an "electronic brochure" standard although they have had some trepidation in doing so. Moreover, our results show that their hesitancy in using these technologies is not only based on practical considerations of feasibility but also on critical political considerations that force candidates to weigh the strategic benefits and costs of each feature.

Research on how and why candidates use Web technology will undoubtedly continue. However, the results reported here make it clear that there is a need to understand the adoption of Web technology as much more than a simple case of viability and comfort with innovations; it is, in fact, also very much a serious political question in which strategic campaign considerations play a large role.

Table 1: Descriptive Data on the Independent Variables

Variable	Cases	Min. Value	Max. Value	Mean	Std. Deviation
2004	444	0	1	.6059	.48922
Senate	444	0	1	.2838	.45134
Democrat	444	0	1	.4640	.49926
Incumbent	443	0	1	.8510	.35648
Female	444	0	1	.1509	.35836
District Partisanship	444	13	86	53.57	10.80
District Income	444	34,962.00	109,760.00	54,053.90	11,678.07
District Education	444	50.40	92.50	81.43	5.98
Funds Raised (millions of dollars)	426	0	19.35	2.03	2.87
Race Competitiveness (margin of victory)	444	0	100	29.42	19.66

Table 2: Percentage of Sites with Dynamic Features

	2002		2004		
Feature	House	Senate	House	Senate	Ave
Multimedia	30.2	57.6	40.4	69.2	43.7
Pages	92.2	93.2	99.5	100.0	96.8
New Info	--	--	76.1	92.5	80.2
Personalization	19.0	16.9	23.8	46.3	25.0
Links	66.4	62.7	77.2	79.1	72.7
Two-Way Communication	9.5	3.4	9.4	13.4	9.2
n	116	59	202	67	444

Table 3: Determinants of Web Technology Use

	Multimedia	New Info	Personalization	Party Link	Two-Way Comm.
2004	.567** (.226)		.771*** (.255)	-.062 (.233)	.321 (.372)
Senate	.483 (.299)	1.614** (.691)	.521* (.314)	-.340 (.328)	-.610 (.541)
Democrat	.362* (.216)	.398 (.340)	.695** (.236)	.290 (.227)	.940*** (.361)
Incumbent	-.022 (.327)	.130 (.636)	-.379 (.342)	-.120 (.356)	-1.044** (.454)
Female	-.081 (.306)	1.058 (.648)	-.135 (.340)	.567* (.307)	-.935 (.641)
District Partisanship	-.006 (.011)	.006 (.015)	.002 (.012)	.011 (.011)	.001 (.016)
District Income	-.115 (.118)	.082 (.184)	-.183 (.139)	-.022 (.116)	-.035 (.190)
District Education	.044* (.023)	.007 (.035)	.010 (.025)	.050** (.026)	.007 (.037)
Funds Raised	.175*** (.063)	-.017 (.106)	.046 (.050)	-.027 (.061)	.130* (.070)
Race Competitiveness	.433*** (.152)	.563** (.244)	-.240 (.165)	-.494*** (.161)	-.510** (.245)
Constant	-4.738** (1.726)	-1.611 (2.418)	-1.261 (1.858)	-4.481** (1.910)	-1.584 (2.595)
Log Likelihood	-255.72823	-113.58215	-224.88909	-237.90866	-121.94352
n	420	256	426	424	426

Entries are Logit coefficients with Standard Errors in brackets. *** $p \leq .01$; ** $p \leq .05$; * $p \leq .10$ for two-tailed tests.

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