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Users and Usage of Community Websites: The myhamilton.ca Experience

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Abstract

This paper presents research results pertaining to the users and usage of the myhamilton.ca community website. Data collection and analysis occurred during two different phases. The first involved the administration of an online survey and the tracking of website activities of 466 actual end-users in which a unique identification feature linked participants' website activities with their demographic and personality data. During the second phase, a more detailed online survey asked for self-reports of website usage from 733 end-users. Results from both rounds of data collection suggest that the website provides a valuable service and is superior to traditional methods of information gathering, but there is a need to increase website usage and to reach a broader demographic. Discussion ensues on how managers of myhamilton.ca are actively addressing these concerns via the myhamilton Renovation Project as a means of increasing website utilization.

Keywords: community website, IS adoption and use, case study, e-Business

1. Introduction

This paper presents findings from two independent rounds of data collection and analysis of the users and usage behaviors of citizens who utilize the myhamilton.ca community website. Community websites or portals serve the information needs of citizens residing in a local jurisdiction (such as a city or a region), as well as outside persons or organizations (e.g., tourists, immigrants, businesses wishing to expand) who have interests in the area. These sites are designed to consolidate access to information about an area in which citizens live, rather than requiring users to locate and navigate multiple independent sites in their search for information. In a sense, these sites function as virtual communities that are computer-mediated spaces facilitating communication, information sharing, social interaction and relationship formation among participating members [7] [8] [11].

In the last few years, many municipalities and regions have launched such websites as a means of better serving their citizenry, especially in Canada [4]. These sites are believed to offer great promise in their ability to help meet the information needs of citizens, to foster community-building, and to promote a city or region to others. However, due to the relative newness of these types of sites, little is known about their effectiveness and reach [5].

How well do these sites meet the needs of end-users? What types of people visit these sites? What usage patterns exist? How are managers of these community websites responding? Answers to such questions are few and serve as the catalyst for the research presented in this paper.

In terms of organization, the next section of this paper first provides background on the myhamilton.ca website itself. Next, the first two phases of data collection and analysis are described, followed by a summary overview of the findings from both rounds of investigation. The paper concludes with a discussion of the activities that are currently underway with the myhamilton Renovation Project to improve the website's design as a means of increasing website usage and reaching a broader demographic of users (for more information on this project, visit http://myhamilton.wordpress.com).

2.   What is myhamilton.ca?

Launched on September 13, 2005, myhamilton.ca or "myhamilton 1.0" (see Figure 1 below) is a community website designed to give citizens, visitors, and businesses "one-place-to-look" or "no-wrong-door" access to information about Hamilton. Major partners involved in the development and support of "myhamilton 1.0" are the City of Hamilton and the Hamilton Public Library, with the City of Hamilton playing the lead role. Various community groups and organizations contribute content. The goal of the website is to provide a gateway to community resources by integrating relevant information sources and a variety of services.
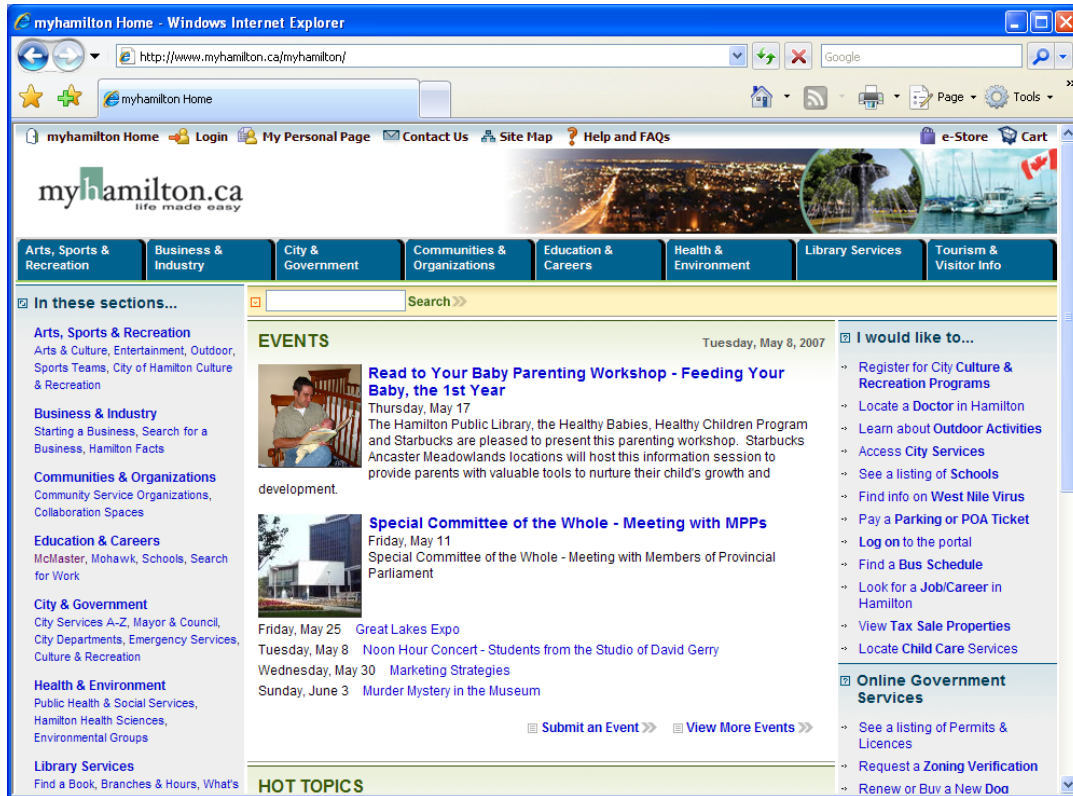

Figure 1. Snapshot of the myhamilton.ca / "myhamilton 1.0" website

The community that the myhamilton.ca website serves is situated southwest of Toronto, with a population of 504,559. Hamilton is the third largest metropolitan area in the province of Ontario, and the ninth largest in Canada [21].

The myhamilton project began in June of 2001. Several community partners saw that Hamilton had a rich collection of local information resources. However, these were not well integrated and local residents were often unaware of them. In addition, there was no shared platform for creating community content and celebrating the diversity of community activities and events. The community saw an opportunity to help address these gaps by working together to develop a comprehensive local portal. With a strong commitment to collaborate, but limited resources available, the City of Hamilton applied for funding through the Ontario Ministry of Economic Development and Trade's Connect Ontario Partnering for Smart Community (COPSC) program. Connect Ontario provided up to $1M (CAD) in matching funding to communities committed to making their communities "smart" through the adoption of technology. In the summer of 2003, Hamilton's proposal was approved for $1M (CAD) in funding with a two year implementation phase beginning in September 2003. The total value of Hamilton's initiative was $3.9 million (CAD) – a combination of financial and significant in-kind support from more than 45 community partners. The resolve and commitment of numerous organizations and individuals to work together for the good of the greater community was critical to success.

The myhamilton website integrates the websites of the municipal government, the public library and several community databases and content areas. Prior to the launch of the portal, these other websites ran independently of each other with their own separate domains and individual service and content delivery mechanisms. Constituents requiring information from multiple entities had to navigate through a maze of different websites, each with its own set of features and functions, as opposed to a unified information technology framework based on common business processes, user databases, security and privacy standards [14].

3. Phase One

The purpose of the first phase of data collection and analysis was to show the linkage between people's behaviour at a community website and their personal characteristics (e.g., their demographics and personality traits). Doing so would allow the research team to gain an understanding of the different types of people who use the site, how these different types of people interact with the site, and why end-users of the website behave the way they do. Such insight can be used to inform the design and effectiveness of website marketing campaigns, the design of the website itself, and add to the growing body of literature on virtual communities, community informatics, and electronic government.

To facilitate the linkage between end-user behavior and personal characteristics, the research team worked in close collaboration with myhamilton.ca's Community Portal Advisory Committee (CPAC) and two lead partners (the City of Hamilton and the Hamilton Public Library). Specifically, the research team worked with CPAC and the lead partners to build in data collection instruments within the myhamilton.ca website itself, as well as to recruit potential participants and to distribute participant incentive rewards. Participant recruitment occurred through: i) a general "Call For Participation" on the myhamilton.ca home page; and ii) individual emails to registered myhamilton.ca users. Both methods of recruitment presented potential participants with an information sheet and web-based consent form that required participants to click a radio button indicating their consent.

Upon granting consent, participants were asked to fill out a web-based end-user survey. This survey collected basic demographic information, gender-related self-concept traits, and technology background. Items were based on those found in the research team's recent investigation of gender, self-concept and Internet use [9], the Georgia Institute of Technology's annual GVU WWW User Surveys (www.cc.gatech.edu/gvu/user_surveys), and scales that measure perceptions of web-based information seeking [10].

From the time that a person consented to participate until the data collection period ended (at most two months – depending upon when a person first agreed to participate), a user's web tracking activity was recorded in web tracking logs. In general, the various sources of web logs can be classified as either server-level or client-level data sources [20]. The primary metrics used in this study were based on server-level data generated through a custom programmed server-side plug-in, and first-party cookies stored on the client-side. These metrics included the following: page attributes such as page views, page transitions, and HTTP referrer information; temporal attributes such as history time stamps, and session times; and visitor attributes such as user identification tags, and remote host information. This raw web traffic tracking data was collected on each participant and used to generate several composite web usage metrics, such as unique visitors, page views, and time on site. The unique visitors metric allowed the researchers to determine reach and audience penetration, page views provided information about the popularity of particular resources and their frequency of access, while time on site helped to assess site "stickiness."

A key strength of the above data collection instruments was that a participant's web tracking data could be linked to his or her survey responses via implementation of a unique id specific to this research project. Specifically, a participant's end-user survey and web traffic data were tagged with this unique id. Extra care had to be taken in protecting the end-user data that was collected because of this unique id. For example, data tagged with a participant's unique identifier was stored in separate database tables on the City of Hamilton's servers and not stored elsewhere in the myhamilton database. There was no linkage between the tables used to store data for this research project and any other table in the myhamilton.ca database. Therefore, it was technically impossible to link a participant's research data to a participant's identity (e.g., contact information) that was stored in other myhamilton database tables. To further ensure privacy was maintained, an independent privacy audit paid for by the City of Hamilton was performed and all recommendations from that audit were carried out.

At the end of data collection, participant incentives were distributed. Each person who participated in the study was eligible for a draw, with a one in ten chance of winning, for a $100 gift certificate at a local mall. The research team

drew the names of the "winners" of the draw and gave these names to the City of Hamilton who distributed the gift certificates. Winners had to show proper identification to claim their incentive award.

Also at this time, web tracking and survey data were extracted into files and sent to the research team for analysis. The use of the unique id stored in participants' end-user survey and web tracking data allowed the team to use generalized linear model techniques to determine how well individual differences (obtained from the end-user survey data) could predict actual usage behavior (obtained from the web traffic data).

A total of 466 people completed the survey. The demographics were skewed towards white women, with an average age between 35 and 39 (320 females, 142 males). Males who responded were slightly older than the women but still fit into the 35-39 age bracket. Most respondents described themselves primarily as urban or suburban (not rural) and were distributed quite evenly throughout the city and its surrounding areas. Overall, this was a well-educated sample. Over 40% of respondents had either a bachelor's or graduate degree. The average household income ranged between $60K and $80K (CAD), with women reporting a slightly higher household income. No sex differences were found in education or marital status. Many respondents declined to report their household composition; of those who did, very few had children in the home. One quarter of the sample reported "single" marital status.

With respect to Internet and technology perceptions, the sample was found to be very experienced with the Internet and both comfortable and competent with computer technology. Significant numbers had performed relatively advanced web-based tasks (e.g. created or customized a web page, changed cookie preferences). Almost all accessed the Internet daily and tended to use high-speed connections from home to do so. More than 25% of those who responded had more than three computers at home. Respondents also connected at work, and to a lesser extent, at public terminals or other access points.

In terms of web metrics, the research team managed to track the behavior of 399 people. However, ten of these did not complete the survey. Further, tracking data was not available for 67 people who completed the survey but did nothing at the website. After the data was inspected for extreme responses in terms of number of sessions and page requests, 11 respondents were eliminated from the data. Further, data where session lengths were minimal (from people who only completed the online survey or those who arrived at the myhamilton.ca website from elsewhere and then quickly left) were removed.

Behavioral analysis identified several patterns of web usage:
- Age: Those in the 45-49 age category did the most sessions (7.18).
- Sex: Women conducted more sessions than men (5.18 versus 4.28), but did not spend more time or request more pages.
- Location in Hamilton: There was a strong effect on the number of sessions, though no effect on either session length or page requests. Mountain Central were the heaviest users (10.75 sessions), recording significantly more sessions than all other areas, with Flamborough and Ancaster (the most affluent areas of the cities) the lowest.
- Marital status: Married respondents recorded more sessions than those who were cohabiting (5.09 versus 4.03) but marital status had no effect on either session length or page requests.
- Education level: There was a positive impact on the number of sessions, but no effect on session length or page requests. The fewest number of sessions were aligned with those having a primary school level of education (1.67) and the most with those having a graduate-level (5.78).
- Employment status: Students conducted the fewest number of sessions (3.52) and unemployed the most (6.39).
- Household composition: Those with fewer people living in a household conducted both more sessions as well as longer ones. For example, one-person households had the highest number of sessions (7.79) and the longest average session lengths (7.38 minutes). Five-plus person households had the lowest number of sessions (4.92) and the shortest session lengths (4.02 minutes).
- Income: Those with higher amounts conducted more sessions but of shorter durations. For example, those with household incomes less than $20K (CAD) recorded significantly fewer sessions (6.05) than those with $40-59K (CAD) and $120K+ (CAD). However, those with household incomes of less than $20 (CAD) had average session lengths of 12.56 minutes compared to those with households incomes of more that $120K (CAD) with average session lengths of 5.46 minutes.

4. Phase Two

The purpose of second data collection and analysis phase was to conduct a more detailed survey of end-users of the myhamilton.ca website. Our goal was to reach a larger end-user sample and to include a different set of questions that could shed more light on the myhamilton.ca user base.

These survey items were based partially on those used a study of the factors that influence citizen adoption of electronic government services [3], which in turn were drawn from pre-established survey instruments from the Technology Acceptance Model [6], Diffusion of Innovations theory [16] [19], and the web trust literature [12] [15]. Additional questions were from the Sense of Community Index also were included [13]. This psycho-social factor is commonly studied in virtual community research and is consistently regarded as being essential in sustaining user participation in virtual communities [1] [2] [17] [18].

The survey comprised a combination of various Likert-scaled and categorical response type questions. No open-ended questions were asked. Respondents were free to skip any question they preferred not to answer. The survey polled end-users on a variety of issues: website usage; website perceptions; personalization of the website; perceptions of information on the website; perceptions on the advantages of using the website; perceptions of website fit; perceptions of website users; level of trust with the Internet; level of trust with community municipal website administrators and other end-users; perceptions of the community; Internet and computer skills; Internet perceptions; and demographics. Contrary to the first phase, we did not employ web tracking, but simply asked respondents for self-reports on their website usage.

Prior to data collection, a workshop was organized to elicit feedback on the survey instrument from the myhamilton.ca managers. Workshop participants not only helped to improve the language and explicability of the survey instruments, but also suggested additional items that would be useful to capture. Their suggestions were used to refine the online survey.

Participant recruitment was handled in a manner similar to the first phase, in that the myhamilton.ca lead partners assisted with recruitment by posting a message posted on site homepage announcing the study and sent email messages targeted to registered myhamilton.ca users. These messages instructed users to visit a "splash page" where they could obtain more information about the research project and start the actual survey. As an incentive to complete the survey, end-users were enrolled in a draw to receive a gift certificate at a local mall or store. Prior to starting the survey, end-users were shown an information sheet/consent form about the project. Once informed consent was obtained, end-users were directed to the actual survey. In order to protect end-user confidentiality and anonymity, contact information collected to handled the distribution of gift certificates (e.g., end-users' names and email address) were stored separately from survey data.

In total, 733 surveys were collected. Overall, respondents indicated that the portal sites were used infrequently, with most visiting these sites only about once every two months to find information. Very few conducted transactions online, but it should be noted that this capability is restricted to only a few services on myhamilton.ca.

Despite this low usage, respondents thought myhamilton.ca provided a valuable service and evaluated it quite favorably on a number of dimensions such as visual appeal and ease of use. They also appreciated site personalization capabilities. Respondents indicated they valued the information that the site provided and believed that the site was superior to traditional methods of gathering information, such as telephoning or filling out forms.

Overall, respondents saw community municipal portal use as being consistent with their own lifestyles, but did not believe that using the site elevated their status or prestige. Users indicated a greater level of trust in the municipality (community) than they did in the Internet, but they did not think that using the portal had made them perceive their municipality (community) as being more trustworthy than during the period prior to their use. For the most part, their sense of community could be described as "lukewarm" with many responses falling either slightly under or slightly over the midpoint. Having said that, respondents did agree that their areas were good places to live where they felt at home and expected to reside for some time.

With respect to Internet and computer skill levels, most respondents indicated they had been using the Internet for more than seven years and were very satisfied with their skills. The average amount of time spent online fell just short

of the 15-19 hours per week frequency category. Connecting at home was by far the most popular choice (68.3 %), followed by work (41.1%). Compared with these locations, relatively few respondents stated they connected at their public library and even fewer through a PDA. Among those who connected at home, DSL high-speed and cable connections were most popular. Most respondents either had never visited an online or virtual community or did so only rarely. Among those who have used social networking sites, YouTube and Facebook were cited most often. In terms of Internet perceptions, most respondents indicated proficiency in their ability to find their own way around the Internet and to locate useful and relevant information. Despite the unstructured nature of the Internet, most felt comfortable and at ease with this lack of structure, indicating a fairly strong sense of control in navigating the web without getting lost. There was a greater preference for respondents when finding information to conduct keyword searches, rather than navigating web pages through hypertext browsing.

With respect to demographics, the average age of respondents fell in the 35-39 years old frequency category, although the data here were sparse. Of the 733 total respondents, 207 did not answer this question and 22 preferred not to indicate their age. Females comprised the bulk of the sample (395 or 75.1% of survey respondents who answered this question); 207 people did not indicate their gender and 10 preferred not to say. Most of the 526 respondents who indicated a race selected "white" (434). Many stated they spoke languages other than English at a general conversational level, with the most popular alternatives being French (80), Spanish (27), and German (24). Respondents also appeared to be very well educated, employed full time, and had an average household income before taxes that fell just above the income frequency category of $60,000-$79,999 (CAD). However, caution should be taken in interpreting this statistic as only 366 of the 733 respondents declared their household income. The majority of respondents who declared their household composition were one-adult households with no children.

5.   Interpretation

Examining the findings across the two rounds of data collection and analysis reveals similarities in terms of end-user demographics and usage patterns of the myhamilton.ca website. Overall, website usage is low and end-users tend to comprise a narrow demographic (i.e., middle-aged, well-educated, predominantly female, white, financially comfortable, and Internet savvy). Despite end-users indicating that myhamilton.ca provides a valuable service that is superior to traditional methods of gathering information, the site appears to be underutilized relative to its capacity. These results are consistent with the research team's findings with other community sites across the province of Ontario [5].

In response to these findings, myhamilton.ca managers are proactively addressing these concerns. A website redesign is currently underway, coined the myhamilton Renovation Project or "myhamilton 2.0." One of the goals of the myhamilton Renovation Project is to increase community website usage by reaching a broader demographic of users and designing the site to better address end-user needs. Details of this project are described below.

6.   The myhamilton Renovation Project

The original myhamilton.ca website was released in 2005. Its infrastructure is now in need of replacement, and the myhamilton development team decided to use this opportunity to reassess what is working, what is not, and to renew the website's strategic direction. A 12-month renovation project commenced in March 2008.

Although the team still receives positive feedback from people about the fact that the website created "one-place-to-look" for the Hamilton community, they also recognize that there are still people the site is not reaching. In addition, usability and other technical obstacles prevent some users from benefitting fully from the services offered on the portal. Moving forward, there are several strategies currently being followed to ensure that "myhamilton 2.0" is able to have a broader impact on the community than that of the first generation site. Recommendations from the above phases of data collection and analysis strongly influenced the strategies being followed.

What is the purpose of a community portal? In "myhamilton 1.0," the vision was defined as "one-place-to-look" or "no-wrong-door" for information about Hamilton. While "one-place-to-look" is still relevant, there is now a need to be more focused on what that vision achieves for the community. In moving forward with the renovation of the portal, myhamilton.ca managers are framing their goals in terms of community development. The Hamilton community has many assets, and myhamilton managers believe that the site can play a key supporting role in mobilizing those assets to improve the community. The myhamilton development team recognizes that a portal platform on its own will not

have a big impact on community development, unless the development team can: i) collaborate with key community initiatives and organizations working to improve Hamilton; and ii) create a site that facilitates connections between people in the community, often at the neighbor level. The development team takes a broad view of the assets in the Hamilton community and recognizes the importance of giving voice to local artists, writers, smaller community groups, service clubs and churches. A community portal's role centers on enhancing the community's knowledge of those assets. While providing access to information about key institutions serving Hamilton is important, myhamilton 2.0 must also facilitate the horizontal sharing of knowledge between communities of interest and individuals.

The myhamilton Renovation Project has several components of performance assessment and consultation. To tap into the knowledge and experience of staff and organizations delivering services through the website, the development team began with an internal operational review. The internal review involved focus groups and surveys of authors and other people involved in managing the website. The website relies on these staff for its success and it is critical for the development team to understand and remove obstacles so that staff are empowered to take ownership for the content and services they are providing on the portal.

The operational review highlighted the need for clear governance and more efficient decision-making. In "myhamilton 1.0," new ground was broken by fully integrating a municipal website, public library website, and a community portal. The City of Hamilton was the lead partner; the Hamilton Public Library and several community groups served as participating partners. However, over the course of the last few years, the size and complexity of the municipal government's operations required that the City of Hamilton focused on internal service issues, leading to a change in the portal's leadership structure. Consequently, the public library is now the lead partner in the new portal. It is anticipated that this will improve the ability of the portal to respond to the needs of community partners and organizations that fall outside the scope of municipal services. While the final governance model of the new portal has not yet been determined, it is clear that the governing body will be empowered to make policy decisions, and portal managers, working within a shared framework, will be able to execute their mandates.

Engaging in a community consultation process is a critical part of the renovation process. The first part of this consultation involves two major components: i) key stakeholder interviews and ii) community focus groups. A third-party research team is helping to ensure the process will not be overly influenced by staff already involved in myhamilton 1.0. Strong leadership is a critical component of a successful community portal. With myhamilton's focus on community development, it is critical that the myhamilton development team connect with community leaders from broad-based, diverse, and inclusive initiatives. For example, the development team is working to align efforts with groups such as the Hamilton's Poverty Roundtable, Early Years Centers, Hamilton Centre for Civic Inclusion, and Education City. Leaders from these groups were interviewed at length to better understand their needs and to make them aware of the myhamilton Renovation Project. Ensuring the portal meets the end-users needs is of primary concern; however, it also is important that partners' needs are considered and addressed. Managers of the myhamilton Renovation Project understand that collaboration with organizations that align with the goals of building community are essential to increasing the community impact of the website.

Examining site feedback, site statistics and research done to date, myhamilton.ca managers have come to understand that like other community portals, the myhamilton site serves a fairly narrow demographic. Consequently, steps were taken to conduct several focus groups targeting potential groups that myhamilton managers wanted to the site to better serve. Focus groups identified customers or potential customers in the following target audiences: educators, seniors/zoomers, students and youth, newcomers, and people active in the arts and culture community. The focus groups and questionnaires have provided useful insights which are helping myhamilton set its new priorities. In addition, the team is engaging in task based usability testing and card sorting on the current site to help us develop site navigation and structure on the new site. Myhamilton managers anticipate a site that looks much different; however, they want to ensure that aspects of the site that currently work well for users are not lost in the new site.

A technical evaluation of content management systems platforms is currently underway. The technical team is using a detailed analysis provided by CMSWatch. Key technical requirements for the new platform include: ability to generate a text only alternative that will serve mobile device users and people using screen readers; ability to support robust interaction with users in multiple ways; an easy to use interface for portal authors and managers; and the ability to repurpose content so custom views can be created for particular audiences. In addition to the technical requirements, myhamilton managers are looking at the skills and knowledge of in-house IT staff. There is recognition of the need to develop on a platform that aligns with those skills. In "myhamilton 1.0," an outside vendor did most of the

development work; this left myhamilton with IT staff that at first did not understand the platform well enough at the outset to make rapid changes. The goal this time is to ensure that on Day One of launch, internal IT staff have the knowledge and expertise to respond swiftly to changes and challenges. The technology will be able adapt to community needs through feedback and consultations – key ingredients to a responsive and sustainable community portal.

7. Conclusion

The Ontario government, regions and municipalities have made considerable investments in the development of "smart" communities across the province. Municipal and regional sites are expected to play an important role in meeting the information needs of their constituents, fostering community-building and enhancing the marketing reach of a region or area, but little as yet is known about how well these kinds of sites are meeting expectations. Only a better understanding of site visitor characteristics and their usage behaviors will allow managers to determine whether their portals are fulfilling needs. In the case of myhamilton.ca, users generally believe that the portal is a useful and convenient source of information, but it is not one that they frequently consult. Furthermore, myhamilton.ca usage is heavily skewed towards an older, well-educated, relatively affluent and Internet-savvy female. Having identified these concerns, in conjunction with insight derived from their own internal review, myhamilton managers are moving forward with consultations directed towards improving their site and their efforts to reach a broader demographic. We acknowledge that myhamilton.ca is but a single example. However, the methods that we have outlined for collecting user characteristic data that is linked with actual usage behavior, supplemented with more detailed questionnaire data, can be used by any portal managers who want to better understand how well their sites are meeting the needs of the their communities. Most importantly, studies of this nature add to the small but growing body of literature on virtual communities, community informatics and electronic government.

8. Acknowledgement

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