Adoption and Use of Community Municipal Portals

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ADOPTION AND USE OF COMMUNITY MUNICIPAL PORTALS

Adoption et Utilisation des Portails des Communautés Municipales

Research-in-Progress Paper

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Abstract

Initial findings from a project examining community municipal portal adoption are reported. The study employs a theoretical model showing a causal effect of organizational factors and portal interface characteristics on a person’s intentions to use a community municipal portal and how individual demographics and perceptions mediate this effect. Six community municipal portals in Ontario, Canada participated. A questionnaire completed by internal portal stakeholders gives background on the portals’ purpose, history, functionality, IT support, and governance. An end-user survey administered to 1,753 respondents polls end-user demographics, perceptions, and behaviors. First phase results give insight on the organizational factors surrounding the implementation of community municipal portals (e.g., partner tensions, governance issues, low end-user involvement, marketing and financial concerns) and how they may influence low usage behaviors exhibited by a narrow demographic. Future phases of the study that further explore the impact of organizational factors and end-user characteristics on portal use are described.

Keywords: community portals, government portals, IS adoption, IS design, human behavior, electronic government, community informatics

Résumé

Les premiers résultats d’une étude examinant l’adoption et l’utilisation des portails des communautés municipales sont présentés. La première phase de l’étude fournit des perspicacités sur les facteurs organisationnels entourant la mise en œuvre des portails des communautés municipales et leur influence sur les comportements de faible utilisation, manifestés par une population hétérogène. Les étapes futures de l’étude sont décrites.
Introduction

This paper outlines and reports initial findings from an “in-progress” three-phased research project that examines the usage and roll-out of community municipal portals. A community municipal portal is defined as a public Web site targeted to the delivery of information, services and resources pertaining to a locally-based government jurisdiction, such as a city, municipality or region. These sites serve the needs of citizens residing in the local jurisdiction, as well as outside persons or organizations (e.g., tourists, immigrants, businesses wishing to expand) who have interests in the area. In a sense, these sites function as virtual communities: computer-mediated spaces that facilitate communication, information sharing, social interaction and relationship formation among participating members (Erickson 1997; Ho et al. 2000; Lee et al. 2003).

The goal of this research project is to understand the factors that affect community municipal portal adoption and use across various cities and regions. The driving force behind this project is the realization that community municipal portals hold great promise in their ability to supply information, provide access to electronic government services, and promote a sense of community, but little is known about whether or how well these portals meet such expectations.

To address this gap, permission was obtained to study several community municipal portals in the province of Ontario, Canada, specifically those that have implemented portals via the Ontario provincial government’s “Connect Ontario: Partnering for Smart Communities” (COPSC) program. Eleven community municipal portals received COPSC funding and all were invited to participate. The six that agreed to partner in this study comprised a varied and sufficient set of portals worthy of investigation. As such, these sites served as excellent samples to examine the factors that influence end-user adoption and use of community municipal portals. In terms of similarities, all six sites promote improved information access and sharing within their communities, as well as the delivery of electronic government services at the city, municipal or regional level. These six sites shared many common features in terms of the information, services and applications they provide but important differences did exist. For example, some of the sites were more municipal-oriented or more community-oriented while others offered a balanced municipal/community orientation. Different technology platforms, governance structures, partner compositions, and portal IT workforce arrangements also were found.

The first phase of this research project – just completed – comprised a qualitative analysis of the organizational factors and interface characteristics of the human-IT system. Results showed how organizational factors (e.g., tensions between partners, governance issues, involvement and participation of end-users in design, marketing and financial concerns) influence the implementation and rollout of community municipal portals. The first phase of the study also gathered descriptive statistics on end-user demographics, perceptions, and behaviors that provide insight into how people behave with these community municipal portal sites. Importantly, the first phase of the study yielded recommendations to remedy the effect of certain negative organizational factors surrounding the implementation and roll-out of municipal community portals as means to circumvent unwanted human behaviors with these systems (in this case, the unwanted behaviors of low use by a narrow demographic).

The second phase of the research project, currently underway, is using structural equation modeling techniques to identify and examine the salient end-user demographic, perception and behavioral characteristics that predict community municipal portal adoption and use.

The third phase of the study will utilize structural equation modeling techniques to: i) examine the significance and size of the relationships between organizational factors identified in the study’s first phase and an end-user’s intentions to use a community municipal portal; and ii) explore the extent to which end-user demographic and perception characteristics identified in the study’s second phase mediate these relationships.

This study offers a creative way of approaching the study of human-IT systems, one that takes into account a more holistic perspective on the interaction of human behavior and IT. For example, a new theoretical model is proposed – one based on past empirical and theoretical investigation—and examined using both qualitative and quantitative methods.

In terms of organization, the remainder of this paper is structured as follows. First, background on the development of the study’s theoretical model is provided, followed by a discussion of the study’s data collection and analysis methods. Next, results from the project’s first phase are summarized. The key organizational factors shaping the adoption and use of community municipal portals are outlined, as are the consequences of these factors for end-user
demographics and behavior, and their possible remedies in the form of recommendations for portal development. Discussion is made comparing and contrasting the study’s findings with the existing literature by emphasizing what is new. Importantly, future testing of the causal associations between organizational and individual differences factors and their consequences on end-user behavior also is addressed.

**Theoretical Model**

Figure 1 below illustrates the study’s high-level theoretical model. The figure shows a causal effect of organizational factors and portal interface characteristics on a person’s intentions to use a community municipal portal, and how individual demographics and perceptions mediate this effect.

![Figure 1: The Study’s High-Level Theoretical Model](image)

The “End-User Demographics and Perceptions” box in Figure 1 is largely based on Carter and Bélanger’s (2005) model of the factors that influence citizen adoption of electronic government services. That model integrates constructs from the Technology Acceptance Model (TAM), Diffusion of Innovations (DOI) theory and the Web trust literature to form a parsimonious yet comprehensive account of the factors that influence citizen adoption of electronic government initiatives. Overall, the model describes how individual perceptions of technology, adoption characteristics and trustworthiness affect a person’s intention to utilize an electronic government service. These same factors will be utilized in the present study. Table 1 below identifies the specific constructs from Carter and Bélanger’s model that will be used to represent end-user demographics and perceptions.

In addition to Carter & Bélanger’s (2005) constructs, the sense of community construct will also be included when investigating end-user demographics and perceptions. 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 (Bagozzi and Dholakia 2002; Blanchard and Markus 2004; Preece 2001; Preece et al. 2004). As such, sense of community was considered noteworthy in its potential to influence a person’s intention to utilize a community municipal portal. To incorporate this factor in the study’s theoretical model, Blanchard and Markus’s (2004) operationalization of the sense of community construct for virtual communities was utilized; see Table 2 below. Note these constructs were derived from McMillan and Chavis’s (1986) Sense of Community Index (SCI), regarded as the authoritative source for measuring sense of community in traditional face-to-face contexts.
Table 1: Constructs from Carter and Bélanger’s (2005) Model of e-Government Services Adoption

<table>
<thead>
<tr>
<th>Source</th>
<th>Construct</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>TAM</td>
<td>Perceived Ease of Use</td>
<td>The degree to which a person believes that using a particular system would be free of effort (Davis 1989)</td>
</tr>
<tr>
<td>TAM</td>
<td>Perceived Usefulness</td>
<td>The degree to which a person believes that using a particular system would enhance his or her [job] performance (Davis 1989)</td>
</tr>
<tr>
<td>DOI</td>
<td>Compatibility</td>
<td>The degree to which an innovation is seen to be compatible with existing values, beliefs, experiences and needs of adopters (Rogers 1995)</td>
</tr>
<tr>
<td>DOI</td>
<td>Relative Advantage</td>
<td>The degree to which an innovation is seen as being superior to its predecessor (Rogers 1995)</td>
</tr>
<tr>
<td>DOI</td>
<td>Image</td>
<td>One’s perception of an innovation as a status symbol (Moore and Benbasat 1991)</td>
</tr>
<tr>
<td>DOI</td>
<td>Complexity</td>
<td>The degree to which an innovation is seen by the potential adopter as being relatively difficult to use and understand (Rogers 1995)</td>
</tr>
<tr>
<td>Web Trust</td>
<td>Trust of the Internet</td>
<td>An individual’s trust in the technology through which electronic transactions and information exchange are executed, the Internet (Lee and Turban 2001).</td>
</tr>
<tr>
<td>Web Trust</td>
<td>Trust of Government</td>
<td>An individual’s trust in the government agency providing an online service to protect privacy and ensure security (Lee and Turban 2001).</td>
</tr>
<tr>
<td></td>
<td>(Institution-based Trust)</td>
<td>A member’s perception of the abilities, benevolence and integrity of the government agency providing an online service (McKnight et al. 2002)</td>
</tr>
</tbody>
</table>

Table 2: Constructs from Blanchard and Markus’s (2004) Investigation of Sense of Community in Virtual Communities

<table>
<thead>
<tr>
<th>Source</th>
<th>Construct</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>SCI</td>
<td>Feelings of Membership</td>
<td>A member’s feelings of belonging to, and identifying with a community (McMillan and Chavis 1986)</td>
</tr>
<tr>
<td>SCI</td>
<td>Feelings of Influence</td>
<td>A member’s feelings of having influence on, and being influenced by a community (Greer 2000; McMillan and Chavis 1986)</td>
</tr>
<tr>
<td>SCI</td>
<td>Feelings of Integration &amp; Fulfillment of Needs</td>
<td>A member’s feelings of being supported by others in a community while also supporting them (McMillan and Chavis 1986; Yoo et al. 2002)</td>
</tr>
<tr>
<td>SCI</td>
<td>Feelings of Shared Emotional Connection</td>
<td>A member’s feelings of relationships, shared history and a “spirit” of community (Greer 2000; McMillan and Chavis 1986)</td>
</tr>
</tbody>
</table>

The “Organizational Factors and Portal Interface Characteristics” box in Figure 1 will incorporate the organizational factors and portal interface characteristics elicited by Detlor and Finn (2002) in their review of the electronic government literature and their own case study of a Canadian federal government youth portal. The organizational factors will include: cooperation across participating government departments; the ability to reengineer work processes; a portal IT workforce with adequate skills; sufficient and sustainable funding; inclusion of citizen participation in design; establishment of electronic government policies and strategies; ability to market the portal; strong leadership to promote the portal vision; and sound governance structure. The portal interface characteristics will include: the customization of the interface to individual user needs and preferences; the provision of relevant, timely, reliable information; the inclusion of robust information access tools (e.g., federated search, metadata classification schemes); the provision of communication tools and discussion areas; and the ability to support government transactions. All these factors are seen as critical in influencing the quality of a delivered portal and ultimately affecting an end-user’s decision to adopt and utilize a government portal on a regular basis.
Methodology

Overall, this study utilizes a concurrent mixed model design (Morse 1991) that combines qualitative and quantitative approaches within and across the stages of its research (Tashakkori and Teddlie 2003). Specifically, two data collection instruments were utilized. The first instrument was a community municipal portal questionnaire where community municipal partners themselves provided background on their portals in terms of their purpose, history, functionality, level of support, governance, general usage, etc., as a means of capturing a profile of each portal under investigation. Community municipal partners identified their own major “perspectives” for each of their portals and questionnaires were returned to the research team for each of those perspectives. Typically, a perspective was a major stakeholder involved in the design and governance of the portal. Some community municipal partners declared only one perspective, while others declared several. Community municipal partners helped identify people to fill out questionnaires for particular perspectives. Questionnaires were composed of 7-point Likert-scaled questions (ranging from “strongly disagree” to “strongly agree”), as well as open-ended questions as a means to capture the context surrounding participant responses to Likert-scaled questions. The organizational factors and portal interface characteristics, identified by Detlor and Finn (2002) and incorporated into this study’s theoretical model, shaped the design of this study’s questionnaire. Initial questions concerning these factors and characteristics were derived from Detlor’s (2000) questionnaire used in a separate empirical investigation of portal adoption and use within a large telecommunications company, and used to form a draft version. Portal administrators from each of the six participating community municipal portals attended a one-day focus-group and provided feedback on this draft version. The language of the questionnaire was improved and additional items were added as per the suggestions of focus group attendees.

The final version of the questionnaire (http://www.business.mcmaster.ca/IS/detlorb/PortalQuestionnaire.htm) comprised three sections. Section One pertained to governance and polled participant perceptions on cooperation among portal partners, the ability of the portal to re-engineer business processes, the extent and competency of the portal IT workforce, the adequacy of portal funding, the involvement of end-users in design, the effect of portal strategies and policies, the extent of portal marketing, the operation and effectiveness of portal governance structures, as well as the competency and importance of portal leadership. Section Two concerned portal features and functions. Here, questions asked respondents about the extent to which the portal supported customization, access to information (e.g., use of search tools, metadata classification schemes), communication with others (e.g., users and administrators), and transactions. Section Three asked respondents to give commentary on the background, history and current uptake of the portal. Examples of the type of questions asked in this section include the degree to which the portal had met its mandate, internal response to the portal, end-user response to the portal, things that went well, things that went poorly, lessons learned, and portal performance metrics. In total, 14 detailed questionnaires were returned across the six participating portals. At least one questionnaire was returned for each of the six participating community municipal portals. To analyze questionnaire data, grounded theory techniques (Strauss and Corbin 1998) were employed to identify recurring themes and patterns via constant comparative analysis. Though Strauss and Corbin warn against the use of a priori concepts in the analysis of data, constructs from the study’s conceptual framework were used to guide the data analysis; this strategy is employed frequently by qualitative researchers, especially those conducting qualitative case studies (Burawoy et al. 1991; Eisenhardt 1989; Gluckman, 1961), as an appropriate one to follow. Additionally, descriptive statistics were generated.

The second instrument was a Web-based survey to end-users of these municipal community portals. The survey polled end-user demographics and perceptions that may affect intentions to use these sites, and gathered self-reports on typical portal usage behaviors. Community municipal portal partners helped recruit end-users to participate in the study; for the most part this was done through a message posted on the homepage of each portal announcing the study or via email messages targeted to registered portal users. Through this advertisement, end-users were instructed 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. Using the study’s conceptual framework as a guide, survey questions were drawn from existing validated survey instruments from the technology adoption, diffusion of innovations, electronic government and virtual community literatures. For example, Carter and Bélanger (2005) – whose theoretical model informs this study’s theoretical model – explicitly identify questionnaire items drawn from other technology and adoption and diffusion of innovations studies; these same
questions were used in the survey instrument administered to end-users. Demographic and perception questions were also drawn from a survey instrument used by the research team in a prior study of community municipal portal adoption and use (Detlor et al. in-press) – these were originally sourced from scales used in other validated survey instruments: Hupfer and Detlor’s (2006) gender and Web information seeking scale, the Georgia Institute of Technology’s annual GVU WWW User Surveys (http://www.gvu.gatech.edu/user_surveys/), and Ford and Miller’s (1996) scales that measure perceptions of Web-based information seeking.

As was done with the community municipal portal questionnaire, a draft version of the Web-based survey was reviewed by a focus-group comprised of portal administrators from each of the six participating community municipal portals. The language of the survey was improved and additional items were added as per the suggestions of focus group attendees. The use of focus groups to facilitate instrument refinement is frequently employed by both qualitative and quantitative researchers (Krueger 1994, O’Brien 1993, Wolff et al. 1993). The final version of the survey (http://www.business.mcmaster.ca/IS/detlorb/EndUserSurvey.htm) 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: portal usage; perceptions; personalization of the portal; perceptions of information on the portal; perceptions on the advantages of using the portal; perceptions of portal fit; perceptions of portal users; level of trust with the Internet; level of trust with community municipal portal administrators and other end-users; perceptions of the community; Internet and computer skills; Internet perceptions; and demographics. In total, 1,753 surveys were collected from end-users across the six participating community municipal portals involved in the study. For the first phase of this project, data analysis involved the use of descriptive statistics as a means of gauging end-user demographics, perceptions, and behaviors.

Note that the six community municipal portals were appropriate to serve as representative samples for this investigation. The cost to develop and design each of these portals runs in the several of millions of dollars (CAD). Almost all of the portals experience thousands of user sessions per day, have multiple partners, dedicated IT staff, varying levels of end-user involvement in design, and complex governance structures. For example, one portal has the city government and the public library as major partners, with various community organizations contributing content. The portal runs on a Microsoft-based solution, and the city provides six developers and several network services staff, while the library provides three of its own developers. An outside vendor assists with warranty item and consulting/training. A portal steering committee comprised of representation from the city, library and community organizations oversees development and roll-out. The portal experiences 21,275 average daily user sessions, 109,068 average daily page views and has over 20,000 registered website users.

First Phase Findings

The qualitative analysis of the community municipal portal questionnaire data yielded seven key organizational factors that were found to impact the potential success of a delivered community municipal portal. The first success factor concerned strong partnerships in that clear benefits were gained through the formation of partnerships in the delivery and support of community municipal portals. Partnerships led to: increased cooperation; enriched portal functionality and content; increased visibility/visits across partner sites; the awarding of grant funding; the distribution of workloads; the sharing of expertise; and the distribution of costs and expenses. The second success factor involved sound portal governance structures or those that: i) give fair representation across stakeholders (including users), ii) has clear policies or documentation that outlines and describes partner responsibilities and accountabilities, and iii) are agile and flexible enough to be effective and offer quick decision-making response times. The third success factor concerned strong leadership such as that which establishes, voices, and facilitates a clear, overarching strategic direction for the portal. The fourth success factor pertained to effective systems development. Whether portals are developed in-house or through a third-party vendor, the data suggested that the best scenario would be a systems development environment that: gives control to in-house portal managers in terms of what functions are delivered, how they are delivered, and when they are delivered; ensures a skilled and sufficiently numbered IT workforce; properly incorporates both end-user and partner needs in the design of the portal; provides thorough testing; supports an effective change management process for portal modifications and enhancements. The fifth success factor concerned sustainable funding in that a constant and sufficient supply of funding appeared to be a critical factor in the success and viability of the six portals examined in this study. Several respondents indicated that funding mechanisms should reduce dependency on grants, increase reliance on self-sustaining methods and/or dependable, long-term sources, and ideally be secured prior to portal development and
Almost all of the 1,205 respondents who indicated a race selected “white” (1,104). Many stated they not to indicate their age. Females comprised the bulk of the sample (891 or 50.8% of the 72% who answered this question). Twenty-nine pointed out that improvements could be made with respect to portal systems development and support. Though most portals were moderately scored on current funding levels, low scores were received with respect to future funding. The need for marketing was highly scored, but current levels of marketing initiatives were moderately scored, while marketing budgets to launch such campaigns were rated as low.

With respect to demographics, the average age of respondents fell just above the 40-44 years frequency category, although the data here were sparse. Of the 1,753 total respondents, 494 did not answer this question and 36 preferred not to indicate their age. Females comprised the bulk of the sample (891 or 50.8% of the 72% who answered this question). Almost all of the 1,205 respondents who indicated a race selected “white” (1,104). Many stated they spoke languages other than English at a general conversational level, with the most popular alternatives being French (160), German (39) and Spanish (37). Respondents also appeared to be very well educated, employed full time, and had an average household income before taxes that fell midway between the two income frequency categories of $110,000-$119,999 (CAD) and $120,000-$139,999 (CAD). Note that the majority of respondents who declared their household composition were one-adult households with no children.

Discussion

From the analysis of the end-user surveys, it appears there is a need to increase portal usage and reach a broader demographic of users. Portal usage is low and end-users tend to comprise a narrow demographic (i.e., middle-aged,
well-educated, predominantly female, financially comfortable, and Internet savvy users). To some extent, low usage and the inability to attract a broad range of end-users may be seen as result of the organizational factors involved in the development and roll-out of community municipal portals. That is, a portal’s inability to strike strong partnerships, realize sound governance structures, secure strong leadership, implement effective system development processes, secure sustainable funding, run effective marketing campaigns, and out perform competitor sites may play a role in the type of users attracted to a community municipal portal and the frequency with which the portal is utilized.

To remedy this effect, a plausible solution would be to mitigate the organizational factors that impede effective portal development and rollout. Based on the above analysis of the community portal questionnaires, the following nine recommendations are suggested: 1) develop a portal governance structure that gives fair representation across stakeholders, outlines and establishes partner responsibilities, and offers flexibility in structure to support decision-making; 2) secure strong portal leadership that advocates and implements a clear, overarching strategic direction; 3) ensure that in-house portal managers have control over what functions are delivered, how they are delivered, and when they are delivered; 4) ensure the portal team comprises a skilled and sufficiently-numbered IT workforce; 5) ensure a process and expertise exists that facilitates the inclusion of both end-user and partner needs in the design of the portal; 6) ensure that thorough testing is conducted before the release of any new portal functionality; 7) ensure an effective change management process is in place for portal modifications; 8) secure sustainable long-term funding (ideally prior to portal development); and 9) run marketing campaigns on a regular basis in order to attract end users and outperform competitor web sites.

These preliminary first-phase findings verify and extend past work that explores the factors affecting government or community website use. First, relatively few studies exist in this area that focus on the internal organizational factors affecting government and/or community website adoption; most concentrate on end-user factors. This study adds to the relatively short list of studies in this area. Second, prior work in this area has identified a laundry list of organizational factors that potentially impact government or community website uptake. For example, Gil-Garcia (2006) identify five contextual factors influencing the adoption and use of government state websites in the United States: i) number of IT employees available to support the website, ii) budget allocation, iii) specialized training for IT personnel, iv) control over website design changes, and v) marketing strategy. Similarly, Detlor and Kim (2002) identify nine factors: i) fostering cooperation across various government departments and partners, ii) ability to change internal work processes, iii) a portal IT workforce with adequate skills, iv) sufficient and sustainable funding, v) inclusion of citizen participation in design, vi) establishment of electronic government policies and strategies, vii) ability to market the portal, viii) strong leadership, and ix) sound governance. From these past studies, it is hard to discern the more salient organizational factors affecting end-user adoption. Results from the first-phase replicate some of the same factors as past studies and thus help to identify the more salient ones: strong partnerships, sound portal governance structures, strong leadership, effective systems development, sustainable funding, and sound marketing. Third, first-phase findings identify a new organizational factor not purported in past work: the lack of competitor sites.

Importantly, however, the study’s third phase will use quantitative techniques to further pinpoint which of the organizational factors, identified through qualitative methods in our first phase, are in fact more important. Recall that the behavioral patterns of over 1,700 end-users were gathered across the six community municipal portals. Though overall usage was low and dominated by a narrow demographic, there were hundreds of individual user cases where usage was much more extensive. In the study’s third phase, structural equation modeling techniques will be employed to explore the degree to which each of the identified seven organizational factors impact portal usage. We hypothesize that those portals which better exemplify the more salient success factors will be the same portals that end-users prefer and utilize. Further, the study’s third phase will examine the degree to which the individual end-user characteristics identified in the study’s second phase mediate the effect of these organizational factors on a person’s intention to utilize a community municipal portal. In this way, the study’s second and third phases will examine the significance and size of the relationships between the organizational factors identified in the study’s first phase and an end-user’s intention to utilize a community municipal portal. This will be a strong value-add to existing theory in this area.

By embarking on such a three-phased research design, this “in-progress” study promises to offer a comprehensive and holistic assessment of community municipal portal adoption and use. This will yield benefits in producing findings of interest to both scholars and practitioners and furthering theory in this human behavior and IT area of research.
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