

2009

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Brian Detlor

*McMaster University*, detlorb@mcmaster.ca

Maureen E. Hupfer

*McMaster University*, hupferm@mcmaster.ca

Li Zhao

*McMaster University*, zhaol25@mcmaster.ca

Umar Ruhi

*University of Ottawa*, ruhi@telfer.uottowa.ca

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## Recommended Citation

Detlor, Brian; Hupfer, Maureen E.; Zhao, Li; and Ruhi, Umar, "Successful Community Municipal Portal Diffusion: Internal Government Factors and Individual Perceptions" (2009). *AMCIS 2009 Proceedings*. 531.  
<http://aisel.aisnet.org/amcis2009/531>

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# Successful Community Municipal Portal Diffusion: Internal Government Factors and Individual Perceptions

**Brian Detlor**

McMaster University  
[detlorb@mcmaster.ca](mailto:detlorb@mcmaster.ca)

**Li Zhao**

McMaster University  
[zhaol25@mcmaster.ca](mailto:zhaol25@mcmaster.ca)

**Maureen E. Hupfer**

McMaster University  
[hupferm@mcmaster.ca](mailto:hupferm@mcmaster.ca)

**Umar Ruhi**

University of Ottawa  
[ruhi@telfer.uottawa.ca](mailto:ruhi@telfer.uottawa.ca)

## ABSTRACT

This paper presents findings and research directions of an in-progress study examining the factors affecting successful community municipal portal diffusion. Several community municipal portal sites in the Province of Ontario, Canada are being investigated via questionnaires sent to portal administrators at six portal sites, and web surveys completed by 1,753 end-users at five of these six sites. In the study's first round, internal government factors shaping the implementation of community municipal portals, as well as usage patterns and end-user demographics, are identified. The study's second and third rounds use these results to test a new theoretical framework that comprises both internal government factors and individual perceptions. Importantly, information quality is suggested to be a key individual perceptions factor that not only affects successful community municipal portal diffusion, but also plays a pivotal role in mediating the effect of internal government factors on a person's use of a community municipal portal site.

## Keywords

Government portals, IS adoption and use, information quality, internal government factors, individual perceptions.

## INTRODUCTION

Community municipal portals are public web sites 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 response to the need to better understand the factors affecting community municipal portal adoption and use, this paper describes an in-depth research investigation of six community municipal portal sites in the Province of Ontario, Canada. These six portals received funding from the Ontario provincial government's "Connect Ontario: Partnering for Smart Communities" (COPSC) program. In total, 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 share many common features in terms of the information, services and applications they provide but important differences did exist. For example, some of the sites are more municipal-oriented or more community-oriented while others offer a balanced municipal/community orientation. Different technology platforms, governance structures, partner compositions, and portal IT workforce arrangements also exist.

## CONCEPTUAL FRAMEWORK

Two key theoretical works shaped the conceptual framework used to guide the study's three rounds of data analysis. The first theoretical work was Carter and Bélanger's (2005) model of the factors that influence citizen adoption of electronic government services. That model integrates individual perceptions 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

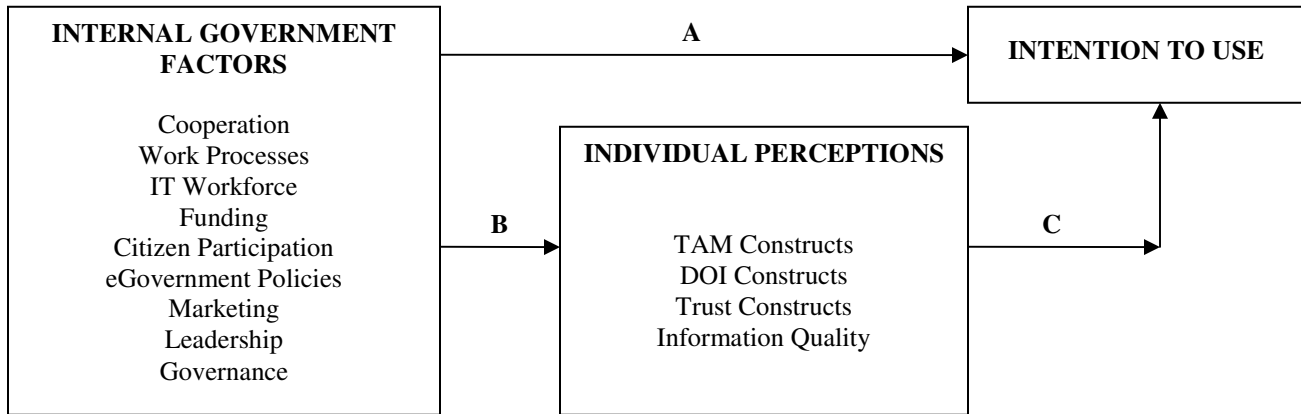
individual end-user perceptions of technology, adoption characteristics and trustworthiness affect a person’s intention to utilize an electronic government service. Table 1 below identifies the specific constructs used in Carter and Bélanger’s model.

The second theoretical work was Detlor and Finn’s (2002) electronic government framework outlining the internal government factors that shape and influence the design and implementation of government portals: 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; establishment of electronic government policies and strategies; ability to market the portal; strong leadership to promote the portal vision; and sound governance structure. Importantly, Detlor and Finn’s model also identified information quality as an influencing individual perceptions construct.

**Table 1: Constructs from Carter and Bélanger’s (2005) Model of e-Government Services Adoption**

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

Figure 1 below illustrates this study’s conceptual framework based on the two aforementioned works. The figure shows a causal effect of internal government factors on a person’s intentions to use a community municipal portal and how individual end-user perceptions of technology adoption, diffusion of innovation, trust, and information quality mediate this effect. The purpose of the conceptual framework is to set the boundaries of investigation and to clarify three rounds of data analysis that comprise this study. The *first round*, denoted by relationship A in the diagram, examines the causal effect of internal government factors on a person’s intentions to use. The *second round*, denoted by relationship C, examines the causal effect of individual perceptions on a person’s intentions to use. The *third round*, denoted by all three relationships A, B & C, examines the mediating effect of individual perceptions on the internal government factors affecting a person’s intention to use.



**Figure 1: The Study's Conceptual Framework**

**METHODOLOGY**

Data collection occurred from July to December 2007. Data analysis for the first-round occurred throughout calendar year 2008 and early 2009. Data analysis for the second round is underway and preliminary results will be reported at the AMCIS conference. A third round of data analysis will commence this summer 2009.

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 internal government factors identified by Detlor and Finn (2002) shaped the design of this study’s questionnaire. 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.

In total, 14 detailed questionnaires were returned across the six participating 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 five of these six participating community municipal portals. The survey polled end-user demographics and individual 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 handle 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) 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.

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 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; portal 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 five of the six participating community municipal portals involved in the study.

### FIRST-ROUND FINDINGS

The qualitative analysis of the community municipal portal questionnaire data yielded seven key internal government 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 launch.

**Sound marketing** represented the sixth success factor; marketing strategies and budgets were seen as pivotal for launching campaigns to raise end-user awareness. Increased traffic and usage were believed to be directly correlated with marketing initiatives, with several respondents suggesting that marketing initiatives should be undertaken regularly and were especially important for sites facing competition from other online sources of similar community-based information. As such, a **lack of competitor sites** was considered a seventh success factor.

In terms of the aggregate findings from the community municipal portal questionnaires for Likert-scaled questions across all six portal sites, high scores were received on the levels of cooperation found between partners and the functioning of governance structures. Tension between partners, however, was shown to mitigate the benefits of partner cooperation, while improvements in governance structures and processes were noted that could promote quicker and more effective decision-making. Leadership was moderately scored with many calling for stronger leadership that advocates a clear, strategic vision for the portal. Development and use of the portal was scored moderate to high; it seems 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 the analysis of the end-user surveys across the five participating portal sites, respondents indicated that the portal sites were used infrequently, as most visited these sites about once every two months to find information. Very few conducted transactions online, but it should be noted that this capability was not available at all portals.

Despite this low usage, respondents thought the sites provided a valuable service and evaluated them quite favorably on a number of dimensions such as visual appeal and ease of use. They also appreciated site personalization capabilities. Respondents indicated they value the information that these sites provide and believe that the sites are 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 sites elevated their status or prestige. Users indicated a greater level of trust in the municipality (community) than they do 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.

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 (67.2 %), followed by work (48.7%). 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 have 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 information of use and relevance. 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 preference for respondents to conduct keyword searches, than navigating pages through hypertext browsing.

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.

## SECOND AND THIRD ROUNDS

For the second and third rounds of data analysis, a theoretical model was formulated. The purpose of this theoretical model was to fine-tune and hone the study's conceptual framework into a form that was suitable and appropriate for deductive investigation and hypothesis testing (see Figure 2).

The seven internal government factors identified in the study's first round of analysis were incorporated directly into the study's theoretical model (see the dotted box in Figure 2).

In terms of individual perceptions to include, two sources were utilized to decide what and how to model these: i) Carter and Bélanger's (2005) empirical results; and ii) the research team's awareness of the importance of the information quality construct:

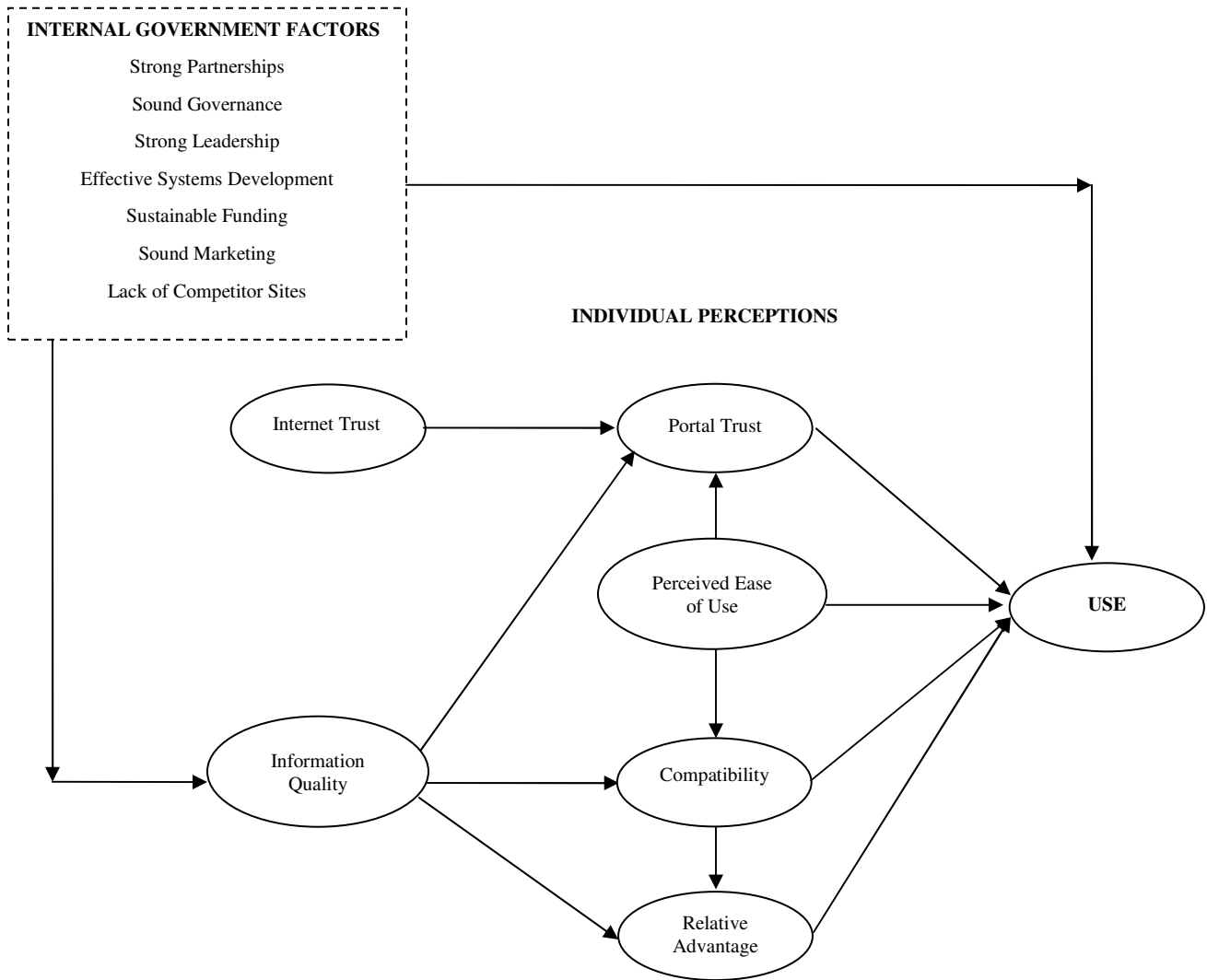
1. In terms of Carter and Bélanger's (2005) empirical results, Carter and Bélanger did not find empirical evidence supporting their entire theoretical model that was based on TAM, DOI and the trust literatures. Rather they found support for a subset of the individual perceptions used in their study. Specifically, the following individual perceptions were shown to have a statistically significant effect on a person's intention to use an e-government service: Compatibility, Perceived Ease of Use, and Perceived Trustworthiness (comprised of both Internet Trust and Trust in Government). Though Carter and Bélanger did not find empirical evidence of Relative Advantage being a significant predictor of intent to use e-government services, they strongly suggested that future e-government research should clarify and investigate the role of Relative Advantage. Further, Carter and Bélanger suggest that future research, when evaluating Perceived Trustworthiness, should evaluate the components of trust (e.g., Trust in the Internet and Trust in the Government providing the web site or service) both separately and in combination. Based on all this, the research team incorporated the following individual perceptions in the study's theoretical model: Internet Trust, Portal Trust, Perceived Ease of Use, Compatibility, and Relative Advantage.

2. With respect to the information quality construct, the importance of information quality on system success is well-documented in the academic literature. For example, Petter et al. (2008), in their recent review of 180 empirical papers spanning the period 1992-2007, identified information quality as one of six key dimensions affecting information systems success. In their review of the literature, the relationship between information quality and user satisfaction is strongly supported. For example, studies have found a consistent relationship between information quality and user satisfaction at the individual level. Studies specifically examining the information quality of web sites, such as content and layout, have found significant relationships between these constructs and user satisfaction (Kim et al., 2002; Palmer, 2002). Petter et al. (2008) also find moderate support in the literature for the positive impact of information quality on individual net benefits, such as decision-making efficiencies, time savings, and higher quality of work. Of interest, Petter et al. (2008) note that few studies in the literature specifically examine the relationship between information quality and use, and that those that have been conducted have yielded mixed support, suggesting the need for more research in this area. Based on the potential importance of information quality on system use, the theoretical model places information quality as a key individual perceptions factor that not only influences community portal use, but also mediates the effect of internal government factors on a person's use of a community municipal portal site.

Last, since the end-user survey instrument asked end-users about their actual usage, in lieu of their "intention to use," the study's theoretical model utilizes actual "use." (see Figure 2).

The second-round of data analysis (currently underway) uses structural equation modeling techniques to identify and examine the salient individual perceptions identified in Figure 2 that predict community municipal portal adoption and use. By the time of the AMCIS conference, this data will be analyzed and preliminary results will be presented to mini-track attendees.

The third-round of data analysis (to be conducted starting summer 2009) will utilize structural equation modeling techniques to examine the whole theoretical model as depicted in Figure 2. Specifically, the analysis will: i) examine the significance and size of the relationships between the seven internal government factors and an end-user's actual usage of a community municipal portal; and ii) explore the extent to which individual perceptions factors, including information quality, mediate these relationships.



**Figure 2: The Study's Theoretical Model for the Second and Third Rounds**

**CONCLUDING REMARKS**

This paper presented findings and research directions of an in-progress study examining the factors affecting successful community municipal portal diffusion. Results from the study's first round identified the internal government factors that shape the successful implementation and use of community municipal portals, as well as general usage patterns and end-user demographic characteristics. The study's second and third rounds were described utilizing a theoretical model developed on the underlying theory used to inform the study's conceptual framework, first phase results, and empirical evidence from the field. Importantly, information quality was suggested to be a key individual perceptions factor that not only affects successful community municipal portal diffusion, but also plays a pivotal role in mediating the effect of internal government factors on a person's intentions to use a community municipal portal site. It is hoped findings from the second round of analysis produced in time for the AMCIS conference will be of great interest and value to attendees.

In terms of limitations, this study is constrained by the investigation of community municipal portals found in a single Canadian provincial context. This may limit the generalizability of the study's results to other portals found in different national contexts. However, to some extent, the selection of a comprehensive set of portal sites with distinguishing yet comparable features mitigates this limitation. Importantly, this study promises to further our nascent understanding of the factors that shape electronic government services adoption and use.



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