A social media text analytics framework for double-loop learning for citizen-centric public services: A case study of a local government Facebook use

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ABSTRACT

This paper develops a framework for facilitating organizational learning through social media text analytics to enhance citizen-centric public service quality. Theoretically, the framework integrates double-loop learning theory with extant models of e-participation in government. Empirically, the framework is applied to a case study of citizen-to-government online interactions on a local government's department Facebook page. Our findings indicate that the missed double-loop learning opportunity resulted from two factors. First, Facebook government-posts were primarily used to advocate the government agenda by educating citizens to change their recycling behaviors without efforts to learn citizens' needs/questions. Second, this single-loop learning orientation sustained the single-loop learning nature of Facebook citizens' posts, precluding their direct and meaningful participation in the city's recycling governance. New insights generated from the case study suggest the framework's usefulness in showing more promising directions for government's double-loop learning through social media platforms to enhance public service quality.

1. Introduction

Despite a growing body of literature on government use of social media platforms for citizen engagement (Bonsón, Torres, Royo, & Flores, 2012; Kavanaugh et al., 2012), there is a lack of research on potential roles of citizen feedback, shared insights, and effective organizational learning in enhancing the public policy-making and decision-making process through social media text analytics. This paper examines, through case study research, how a local government uses Facebook for organizational learning from social media interactions with citizens. The problem that local governments face is finding best ways to harness new digital social media platforms and make meaningful changes to public service delivery through citizen feedback.

Argyris (1976, p. 367) argued that single-loop learning encourages participants to "learn to perform as long as the learning does not question the fundamental design, goals, and activities of their organization." Hence unilateral control often accompanies advocacy, underlying single-loop learning. Against this, Argyris (1976) argued that in double-loop learning, participants are encouraged to ask questions about changing fundamental aspects of the organization. In order to

effect major change of attitude required by double-loop learning, Argyris (1976) argued that the governing variables are valid information, free, and informed choice, and internal commitment among participants.

This paper aims to make theoretical, methodological, and empirical contributions toward a better understanding of effective use of social media platforms and social media analytics for government to achieve double-loop learning which is considered to mediate enhanced citizen-centric public services. Theoretically, we have integrated double-loop learning theory (Argyris, 1976) and e-participation models (Chadwick & May, 2003; Macintosh, 2003; Reddick, 2011) to develop an Integrative Framework for Double-loop Learning through Social Media Text Analytics (DLSA) for citizen-centric public services in government through effective use of social media platforms.

Methodologically, we have developed a computational approach (i.e., social media text analytics) for determining the impact of social media pages of public services in terms of: (1) degree of citizen participation in public service delivery and (2) inherent organizational learning opportunity (i.e., whether single-loop or double-loop) for public service enhancement. Empirically, we have applied this DLSA framework being developed in this research to guide the interpretation of our case study findings of the use of Facebook to promote the city-wide recycling campaign by the City of San Antonio's Solid Waste Management Department (SWMD) in the United States. Our DLSA framework

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application is used to guide our case analysis enabling new insights and important lessons to be inferred on how learning can be incorporated in the use of social media in local governments to better provide enhanced citizen-centric public services. Data from the Facebook page of the City of San Antonio SWMD is text-mined to examine double-loop learning and e-participation. By applying this text mining methodology to citizens' concerns and sentiments toward public services in the City of San Antonio, we can determine whether single and/or double-loop learning has been used to improve public service delivery.

Theoretically, the DLSA framework integrates extant theory and models for a better theoretical explanation for shared double-loop learning. There are three e-participation models presented in the literature that are relevant to this study (Chadwick & May, 2003; Macintosh, 2003; Kamal, 2009; Reddick, 2011). The first model is the managerial, which focuses on efficient service delivery of government through e-government. The managerial model is the most passive, with little citizen participation. The second model is consultation, where citizens' input is included in the policy-making process. The third model, the highest form of e-participation, is the participatory model, which focuses on two-way interaction between government and citizens. In the participatory model, citizens' feedback can directly shape public-policy. The participatory model represents the most active form of citizen participation. All three models are examined in this study along with the theory of double-loop organizational learning first articulated by Argyris (1976).

In order to examine the utility of the proposed framework, the following two research questions are examined.

1. *How can double-loop organizational learning be facilitated to align social media use in government with the delivery of citizen-centric public services?*
2. *Does the application of the DLSA framework to government use of social media help generate insights into single and/or double-loop learning opportunities through the government use of social media?*

These research questions provide answers to the current use of social media platforms in local government for e-participation and the potential for our theory for public service improvement.

The paper is organized into five sections. The second section provides the literature review and conceptual framework that is tested in our case study. The third section provides background information on our case study of the City of San Antonio SWMD. The fourth section describes our research methodology. Our fifth section presents text-mining analysis of the Facebook page contents. Our sixth section provides a discussion of the major findings from our analysis. The final section has our conclusion, which summarizes the major research results from our case analysis, demonstrates the lessons learned, and provides future research directions.

2. Literature review and conceptual framework

2.1. Citizens, e-government, and social media

Thomas and Streib (2003) were one of the first to argue that e-government represents a new and important form of citizen-initiated contact with government. E-government is said to increase citizens' satisfaction with public service delivery (Welch, Hinnant, & Moon, 2005). Research shows that citizens who use the Internet to initiate contact with government experience higher levels of satisfaction than other more traditional contact methods such as the phone or visiting a government office (Cohen, 2006). Moreover, e-government is said to increase citizens' trust in government when they already trust government (Parent, Vandebeek, & Gemino, 2005). Further empirical research shows that trust is more likely to be increased for citizen-initiated contacts with government through e-government at the local government level, compared to the federal government level (Tolbert & Mossberger, 2006). Therefore, the importance of understanding the enabling role of

citizen engagement in e-government has been clearly demonstrated in the literature.

Social media platforms present an emerging area of citizen-initiated contacts with government. In the context of the public sector, social media can be defined as a group of technologies that allow public agencies to create greater citizen engagement (Criado, Sandoval-Almazan, & Gil-Garcia, 2013). When government uses social media platforms there are opportunities for democratic participation, coproduction, and crowdsourcing solutions and innovations (Bertot, Jaeger, & Hansen, 2012; Linders, 2012). Social media tools can provide for improvements in government transparency, policy-making, public service delivery, and knowledge management (Bonsón et al., 2012; Kavanaugh et al., 2012).

However, governments must understand the risks associated with using social media as well as the benefits of social media for public service delivery (Picazo-Vela, Gutiérrez-Martínez, & Luna-Reyes, 2012). One important risk is the increased demands made by the public, through a direct communication channel such as a Facebook page. This is especially the case when the government does not have sufficient resources to meet these demands. In contrast, the benefits for social media use in government are increased citizens' participation and engagement, promoting greater transparency, and working with citizens to develop innovative solutions to complex societal problems (Spilotopoulou, Charalabidis, Loukis, & Diamantopoulou, 2014).

Despite the potential benefits of social media use in government, however, empirical research to date primarily shows that social media is predominately used to "push" information to the public in major U.S. cities (Mossberger, Wu, & Crawford, 2013). Research also shows that most public and nonprofit human services agencies are using Facebook and Twitter as one-way communication tools to share key information about their organization (Campbell, Lambright, & Wells, 2014). However, this research shows that there are examples of government using social media to conduct some citizen interaction. Most of the activities are directed toward marketing organizational activities, raising awareness of community events, and promoting specific organizational agendas. There is limited evidence that most public and nonprofit agencies were using social media platforms for encouraging and gathering feedback from their citizens for the purpose of learning from each other, as this paper investigates.

2.2. Double-loop learning and e-participation

E-participation is defined as citizens' voluntary participation and involvement in public administration and policy through the use of web-based applications (Kim & Lee, 2012, p. 820). E-participation can serve to encourage two-way communication between government and citizens, to educate citizens, legitimize government decisions, open up the policy-making process, and provide learning opportunities (Kamal, 2009). The most important aspect of e-participation is to increase citizens' ability to participate in governance, including participation in the political process and transformation of public service delivery (Kamal, 2009; Sanford & Rose, 2007; Susha & Grönlund, 2012; Vicente & Novo, 2014). Citizens can participate with government through different channels. This multi-channel strategy can be used to improve citizen participation (Sandoval-Almazan & Gil-Garcia, 2012). E-participation applications with user-friendly designs are likely to create a positive perception of government and increase transparency and trust in government (Kim & Lee, 2012). For local governments, e-participation can be costly to operate because additional resources are required to engage citizens through the Internet which will add to the total government budget (Andersen, Henriksen, Secher, & Medaglia, 2007).

With regard to citizens' e-participation, Facebook use shows higher engagement levels of citizens with local governments, especially when they promote posts by citizens (Bonsón, Royo, & Ratkai, 2015). Research shows that citizens, when given the opportunity, are more active in engaging in discussions initiated by local governments. Research also