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Examining the socio-technical determinants influencing government agencies' open data publication: A study in Taiwan

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ABSTRACT

Open government data has become an important movement for government administrations around the world. Nevertheless, government agencies tend not to open their datasets and can act reluctantly to embed the concept of data publication in their daily operations. Accordingly, this study examines the determinants that are argued to have influences on the government agencies' intention and behavior of open data publication. Relevant hypotheses are developed through literature review to form a preliminary research model, and respective influences of the determinants on the government agencies' intention and behavior to publish datasets are statistically tested. The empirical results show that the determinants account for 60.4% of the variance in agencies' intention and 54.2% of the variance in agencies' behavior. All the determinants are statistically significant except for perceived effort and perceived benefits. Specifically, facilitating conditions and organizational capability are the two factors having the strongest positive effect. Perceived usefulness, external influence, and organizational culture also have positive influences while perceived risks indeed incur a negative impact on the intention. On the contrary, perceived effort and perceived benefits are found to be insignificant. Lastly, intention is statistically significant and indeed acts as a strong antecedent to predict government agencies' activities of open data publication. Practical implications are also offered to practitioners. A designated government agency should act as the coordinator to help agencies obtain facilitations from others. Agencies' concern of data misuse should be mitigated, as it is found to be the major driver having a negative impact. The limitations and future research directions are also discussed. The findings and discussions of this study are expected to contribute to the current open data literature.

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1. Introduction

In recent years, open government data has drawn attention from academia and both the public and private sectors around the world. While government is considered one of the largest data creators across different domains (Dawes, 2012; Jetzek, Avital, & Bjorn-Andersen, 2014), the goal of open government data is to create a sustainable ecosystem and infomediary models by using government datasets to create social, economic, and political impacts (Janssen & Zuiderwijk, 2014; Lee, Cyganiak, & Decker, 2014). Particularly, open data can contribute to transparency and accountability of government. By granting access to government datasets, civilians, policy makers, journalists, scientists, and enterprises can have the opportunities to use, control, and analyze the data to generate new usage and create social value and economic growth (Attard, Orlandi, Scerri, & Auer, 2015; Chan, 2013; Dawes, 2012; Dawes & Helbig, 2010; Hartog, Mulder, Spée, Visser, & Gribnau, 2014; Janssen, Charalabidis, & Zuiderwijk, 2012; Jetzek et al., 2014; Kucera & Chlapek,

2014; Lassinantti, Bergvall-Kåreborn, & Ståhlbröst, 2014; Meijer, Conradie, & Choenni, 2014). Accordingly, open data allows governments to harness the collective wisdom of the public to spur innovations, and governments are expected to respond to challenges and to meet citizens' needs in a more cost-efficient and productive manner (Janssen et al., 2012; Kassen, 2013).

However, a recent global report (Open Data Barometer) shows that there is still a long way to go for the public to acquire government data. The report indicates that government datasets such as spending data, company registers, and public sector contracts remain inaccessible to the public, and the progress of embedding open data policies is slow around the global government administrations (World Wide Web Foundation, 2015). The reuse of public sector information has been a relatively obscure policy domain. Although open government data has recently attracted more attention, it remains clouded and the related interrelations with other policy areas are complicated (Bates, 2014). Government agencies tend to lack clear guidelines for open data publication to external parties (Albano & Reinhard, 2014; Conradie & Choenni, 2014). As researchers indicate, open government data is a complex process, and there are many serious considerations acting as socio-

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technical determinants influencing the intention of government agencies to publish datasets (Albano & Reinhard, 2014; Barry & Bannister, 2014; Conradie & Choenni, 2014; Janssen et al., 2012; Kucera & Chlapek, 2014; Martin, 2014; Martin, Foulonneau, Turki, & Ihdjadene, 2013a, 2013b; Rosnay & Janssen, 2014; Yang, Lo, & Shiang, 2015; Zuiderwijk, Janssen, Choenni, & Meijer, 2014; Zuiderwijk, Janssen, Choenni, Meijer, & Alibaks, 2012; Zuiderwijk, Janssen, Meijer, et al., 2012; Zuiderwijk, Susha, Charalabidis, Parycek, & Janssen, 2015). Recent studies have shown that although required by open data policies to participate in related initiatives, government agencies may still act reluctantly toward opening their datasets. Agencies tend to publish data that is relatively safe, possess no intention to gain feedback about data use, and neglect user needs of open data (Janssen et al., 2012; Peled, 2011). It is critical to have policies that can continue promoting and stimulating the release of open government data (Nugroho, Zuiderwijk, Janssen, & Jong, 2015).

Accordingly, this study argues that it is important to examine the potential determinants influencing government agencies' intention and behavior of open data publication. Particularly, this research is one of the first quantitative explorations to examine the determinants. Based on the literature review of interagency information sharing, open government data, and related research, hypotheses are developed to examine the potential determinants. The influences of the determinants are statistically tested, and the respective positive and negative strengths of the determinants are discussed. Specifically, a national survey is conducted among the government agencies of Taiwan to provide empirical data for quantitative analysis.

In the following section, a literature review is first conducted for construct development, and the hypotheses of the study are proposed. Next, the paper describes the research method of the study, including data collection and the techniques applied to analyze data. Then, the paper presents the reliability and validity of the data analysis of the research model. Next, the findings and implications of the empirical results are discussed. Finally, in the conclusion section, the paper discusses the contributions and limitations of the current study and the directions for future research.

2. Literature review

In this study, a research model is developed to examine the potential socio-technical determinants that are argued to have influences on the government agencies' intention and behavior of open data publication (see Fig. 1). Specifically, the proposed research model consists of eight exogenous constructs: perceived usefulness, perceived effort, external influence, facilitating conditions, organizational culture, perceived benefits, perceived risks, and organizational capability. In addition,

intention and behavior act as the two endogenous constructs in the research model. The eight exogenous constructs are expected to have direct influences on intention and indirect influences on behavior through intention. The development of the proposed research model and hypotheses are discussed in the following subsections.

2.1. Open data adoption

According to innovation diffusion theory, innovation is to establish the validity and formality of new things. Innovation can be an idea, practice, object, process, or anything that is new to individuals or organizations (Rogers, 1995). Under this conceptualization, open government data can be considered a new idea and process to be gradually embedded in and integrated with the existing bureaucratic structure of government agencies. Fundamentally, open government data can be thought as an innovation to help government agencies to achieve the principles of open government, including transparency, participation, and collaboration. Rogers (1995) further indicates that innovation can be equal to technology, which is applied to accomplish a designated goal, and both software and hardware may be included in the changing process. Accordingly, while open government data is an emerging innovation across the public sector, it can be further conceptualized as a process of technology acceptance that government agencies have to adopt the concept through dataset preparations in open source formats, implementations of application programming interface, and data distribution using open data platforms for providing public access. Similarly, open data users have to accept and use related open data technologies to engage in open data initiatives. Researchers have applied technology acceptance models to empirically examine determinants influencing users' acceptance and use of open data technologies (Zuiderwijk, Janssen, & Dwivedi, 2015). Accordingly, this study also develops determinants influencing the government agencies' intention of open data publication based on the conceptualization derived from technology acceptance models.

In addition, government agencies are situated in a context where its institutional environment can influence the development of formal structures of organizations. Researchers argue that formal structures represent the reflections of rationalized institutional rules. Related institutional structures are developed for organizations to incorporate so that they are able to obtain legitimacy, stability, and increase survival prospects (Aldrich & Ruef, 2006; DiMaggio & Powell, 1983; Fountain, 2001; Meyer & Rowan, 1977). Accordingly, the adoption of the related institutional structures such as designated tasks, operational procedures, and organizational roles help organizations to gain confidence while legitimacy in the institutional environment helps ensure organizational survival. Nevertheless, the adopted institutional structures

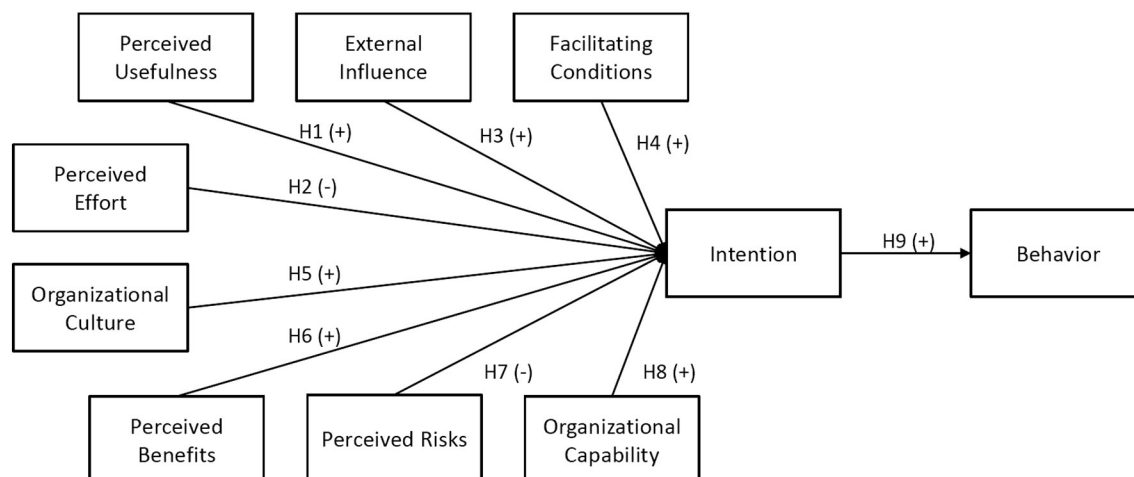


Fig. 1. The research model for examining the potential determinants of open data implementation. Note: (+) positive influence; (–) negative influence.

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