



Measuring E-government performance of provincial government website in China with slacks-based efficiency measurement



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ABSTRACT

As the rapid development of the information science and technology especially the network technique, e-government has a very promising application foreground. E-government acts as a quite new form of government affairs and also an effective exploration of government innovation. The development and popularizing of the network puts forward a new request and challenge to the government. This paper devotes to evaluate e-government performances of 31 provincial government websites in China using the method of DEA. Research results show that most of these provincial government websites operate at an inefficient level and in a bad manner. Moreover, the e-government efficiency differences lie in both different individual provinces and different districts. It is confirmed that the less developed western provinces achieve a higher efficiency mean than the eastern and middle ones.

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1. Introduction

With the fantastic spur both in industry and in economy, great changes have taken place in China since its opening and reforming to the outside world over the past three decades. Especially, the rapid-developed information technology promotes the revolutionary reform of productivity and brings a deep transform in the environment of running a modern business and in contemporary management model, and management tool. This situation leads to a usual challenge to governmental sectors. For example, with the rapid increase in the number of Internet users, how to manage Internet smut, false information in chat rooms, and disclosure information on unexpected events timely become multi-hot issues. Along with the electronic commerce explosive progress, Chinese

governmental institutions are getting to put more emphasis on the application of electronic government (e-government) using computers and communication techniques.

The appearance of Internet changes people's lifestyle and it has been a very important part of people's everyday life, which offers the convenience to implement on-line marketing of the traditional enterprises and new service industries, so does on-line electronic government affairs. By the end of December 2013, there have been a total of 618 million Internet users in China and the Internet penetration rate reaches 45.8% more than in 2012 with an increase of 3.7% (Anon., 2014). It is not hard to infer that the number of people who uses Internet should be further on the rise in the following years along with the growth of the so-called Internet generation. This also provides a mass-based condition for on-line e-government affairs management. Thus, the Internet is becoming closer and closer to a wide variety of economic activities, such as shopping, logistics, payment and financial applications, and the related government activities, such as online approve management, online business figures statistics and so on. This newly

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paperless office requires civil service to enhance work efficiency and speed up the transformation of government functions which challenges the government administration.

The advance of e-government will boost the government's ability to manage many kinds of social affairs and obtain both good economic efficiency and social efficiency remarkably. It reduces management cost greatly and enhances the working efficiency of the government. However, whether e-government will play its expected role effectively in government administration and reflect the current social management requirements set onto government performance by modern public administration and really improve the working efficiency in governments, depend on the construction of an advanced government performance evaluation system with the characteristics of e-government and the scientific evaluation method. Otherwise, e-government will not live up to peoples' expectations with its costly construction, first-rate equipment but low efficiency and poor performance. So far, the status quo of China's e-government is far from satisfaction due to incomplete regulations for information and many problems in the process of information collection, processing and maintenance.

Evaluating the e-government performance of websites has been a constant concern of searchers in different fields. Many prior e-government researchers tend to adopt qualitative methods in general and make contribution to theoretical reinforcement but neglect practical applications (Heeks and Bailur, 2007). Serving as a non-parametric programming approach, data envelopment analysis (DEA) developed by Charnes et al. (1978) is frequently used for evaluating the relative efficiency of a set of homogeneous entities called decision making units (DMUs) with multiple inputs and outputs. It has been a popular quantitative research method since the advent in 1978 owing to its excellent properties. For example, it owns unit-invariance property and does not require presupposing any production functional form at first. This study will further explore this issue and focuses on how to evaluate and account for the government performances of 31 official provincial/municipal websites quantitatively in China and promote their efficiency improvements using the non-radial slacks-based efficiency measurement (J-SBM model) in DEA.

2. Literature review

2.1. E-government

Since the initial proposal of the concept for e-government, e-government began to receive high attention and rapid development when the Internet and web-based technologies began commercialization in the 1990s. A host of research topics especially related to e-government arise at the turn of this new century. The evaluating ways and the selection of evaluation criteria for websites are different and still require more theoretical justification. Most of the previous approaches have focused either on basic management content or a specific set of web site outcomes (Miranda et al., 2009b). They either use subjective factors, such as easy-access, text clearness, presentation quality, etc., as performance indices (see Buenadicha et al., 2001; Cullen and Houghton, 2000; Evans and King, 1999) or using the investigation of questionnaire survey by manually

to determine the specific website assessment indices (see Miranda et al., 2009b), such as the accessibility, speed, navigability and content of the website.

Moreover, the diffusion of e-government is widely studied. For instance, technological factors, organizational factors and environmental factors found by studies are the major influencing factors with respect to diffusion of e-government (Specific details see Zhang et al., 2014). Gil-Garcia and Pardo (2005) presented an analysis of a selected set of resources that government practitioners use to guide their e-government efforts. Their analysis examined the extent to which IT-related research is reflected in the practical guides. E-government has been proposed as a way to increase citizen trust in government and improve citizen evaluations of government generally. Tolbert and Mossberger (2006) used two-stage models to analyze recent Pew survey data and explored the relationship between e-government use, attitudes about e-government, and trust in government.

As an open, complex system with dissipation structure, e-government imposes a great impact on the traditional management pattern of government operations. Whether the service goal and style of e-government is objective, just and scientific or not, it will directly affect the operation quality of the government management. As Ma et al. (2005) pointed out, China's leaders also expect to foster administrative reforms by transforming government functions, streamlining procedures, and enhancing administrative transparency through e-government. Ma et al. (2005) further indicated that these reforms are designed to support China's economic development agenda through brief case studies of actual e-government experiments at both the national and city levels. Miranda et al. (2009a) stated that due to more increasing importance, the Internet makes the usability of municipal web sites a critical factor in government–citizen communication. They proposed and tested a model for evaluating the potential of municipal websites.

The above literatures mainly discussed the theoretical framework of the issues related to e-government affairs mostly from the qualitative point. These researches are subject to subjective influences. However, one major advantage of DEA method is to avoid the subjective factors in model implementation. It does not need to assign weight for input and output indices. Next, we will introduce the slacks-based metric in DEA that we are going to employ.

2.2. Slacks-based efficiency measurement in DEA

In recent years, DEA has been widely extended and applied in many fields in different countries (Cooper et al., 2000). The technique of DEA depicts a best-practice production efficient frontier formed by observed DMUs and provides a benchmark or reference point on this frontier for each DMU to compute its efficiency score. The efficiency value obtained by the classic CCR model indicates how efficient a DMU has performed when comparing with other DMUs so as to determine its efficient level within the group of all DMUs. The CCR model works as a radial model and may find the weakly efficient reference point for the current evaluated DMU which still have positive amount of input excesses or output shortfalls, for it is not the strong Pareto-efficient reference point (Chen, 2013). So the evaluated

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