



The electronic government performance of environmental protection administrations in Anhui province, China



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ABSTRACT

This study evaluates the e-government performance of environmental protection administrations in the 16 cities of the Anhui province based on an analysis of their websites. For this purpose, the study utilized a super-efficiency slacks-based measure (SBM) model based on three first-level indicators: the degree of public participation, website service quality, and public satisfaction. The rankings of these indicators indicate that the public participation and service quality of these e-government websites were highly consistent. In other words, the greater the public participation, the better the appraisals of service quality, and vice versa. However, the comprehensive performance analyses indicate that only 4 of the 16 e-government websites performed at the efficient frontier, while the remainder were inefficient. Therefore, e-government operations in the Anhui province must be improved to achieve efficiency.

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1. Introduction

At present, there are two definitions of electronic government, a concept first proposed in the 1990s. The United Nations Economic and Social Council defines e-government as a governmental mode of public management that is based on the intensive and strategic application of information and communication technologies. E-government aims to improve efficiency; enhance governmental transparency; lessen financial restrictions; raise the quality of public policies; establish good relationships between the government, the society, and the citizens; improve the quality of public service; and achieve wide social participation. In comparison, the World Bank contends that e-government mainly focuses on the use of information technologies (such as the Internet and cloud computing) by governmental organizations to change relationships between governmental organizations, citizens, and enterprises. These technologies could be used for different objectives, such as providing more efficient governmental

services to citizens, improving the relationship between enterprises and the government, promoting civil rights, and increasing governmental efficiency. Information technologies provide many benefits such as reduced corruption, increased transparency of governmental decisions, easily accessible government services, increased profits, and reduced running costs.

Along with rapid economic development, the development of e-governance has been increasingly emphasized by many national governments, which have subsequently encountered problems in appraising its performance. The evolution of e-governance can be examined through five interrelated objectives: a policy framework, enhanced public services, high-quality and cost-effective government operations, citizen engagement in democratic processes, and administrative and institutional reform (Dawes, 2008). Until now, although there have been many e-governance performance appraisals, most of them only considered the websites of specific sectors at the national level, not at the regional level. This study specifically selected local official environmental protection websites for analysis because of the increasing interactions between the citizens and the government regarding environmental issues. Moreover, unlike previous studies, we built an appraisal

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indicator system from the viewpoint of the citizens and designed a related questionnaire. Furthermore, some valuable analyses of the questionnaire results were undertaken.

The remainder of the paper is organized as follows: [Section 2](#) summarizes the relevant literature on e-governance from an international perspective. [Section 3](#) presents a discussion of the data sources and questionnaire quality. [Section 4](#) provides the empirical analyses conducted in this study. The paper concludes with suggestions for certain cities regarding the future operation and development of e-governance.

2. Literature review

E-governance performance appraisal is a comprehensive process that is based on the systematic investigation and analysis of the construction, operation, management, and impact of websites. It aims to identify the existing shortcomings of e-governance operational processes and to take measures to overcome them for further e-governance development. The appraisal of e-governance performance involves the establishment of an indicator system and the selection of appraisal methods. Internationally, most studies followed the e-government standards established by the United Nations. Since 2002, the United Nations Division for Public Economics and Public Administration has been releasing appraisal reports regarding the e-governments of its member countries, rating governmental websites according to 21 indicators of four major aspects: online information and service quality, correlation of page content and site functionality, effectiveness, and spontaneity of information dissemination and disclosure. In 2008, the bureau released four annual reports in which the appraisal indicator systems contained two first-level indicators: e-government completeness degree and e-government participation degree. The former is used to evaluate the scope and content provided by e-government, and is composed of three second-level indicators: the governmental website evaluation index, the communication infrastructure facility index, and the human resources index. The latter is used to investigate governmental working process, policy formulation, and public interactivity, and is composed of three second-level indicators: electronic information, electronic consultation, and electronic decision. Moreover, in 2000, the European Union also formulated appraisal indicators for e-government development, among which the most important is the Statistical Indicators Benchmarking the Information Society (SIBIS).

China has been involved in governmental Internet engineering construction since 1999, and in 2000, it clearly stated that the development of e-governance should be a priority. To this end, China re-established the National Informatization Leading Group in 2001, and subsequently held several conferences to promote information technology development planning and e-government. The Chinese authorities also promulgated an “electronic signature law” and a series of administrative regulations and documents, which greatly promoted e-government development in the nation. China’s e-government construction ability was developed through attention to international practices and research; however, the risks and potential failure of its e-government projects are very high. For example, the failure rates of e-government projects in developing countries can be as high as 60% to 80% ([United Nations,](#)

[World Public Sector Report, 2003](#)), according to the United Nations’ research on global e-government operations.

With the continuous development of e-government, many scholars have paid attention to the appraisal of this technology. Many studies regarding the evaluation of safety, interactivity, and other aspects of e-government have been conducted. Although there is still no definite appraisal system and method of e-government, great success has been attained. Examining the low public enthusiasm for e-government in developing countries, [Alshawi and Alalwany \(2009\)](#) created a strict and comprehensive e-government appraisal system standard to determine the relevant factors that influence e-government use, and to aid governments in appraising their performance. [Tsohou et al. \(2013\)](#) performed a quantitative analysis of e-government performance based on the empirical investigation of 13 e-government service platforms in Turkey using data envelopment analysis (DEA). The use of DEA can visually identify the shortcomings of e-government operations and provide suggestions for improvement. [Hsieh et al. \(2013\)](#) conducted a quantitative DEA of the effectiveness of the e-government of 1124 governmental divisions in 25 cities and counties in Taiwan. [Dolan \(2014\)](#) presented an appraisal model that uses the strategic inventories of ministry-level governmental websites in Djibouti, Finland, India, Kenya, Namibia, and Peru. This model has the potential to solve issues regarding website safety, database integration, interior communication, horizontal cross-organization, citizen interactivity, and transparency, more comprehensively.

The results of in-depth interviews with e-government experts indicate that both geographic location and population scale have notable effects on e-government performance. [Kaisara and Pather \(2011\)](#) extended the common electronic service quality research method to e-government appraisal, and examined the service quality of the South African e-government using a multi-project tool method. The results of their study revealed that e-government services could be effectively appraised on six aspects: website design, linkage guidance, communication and interaction, page aesthetics, information quality, and service safety. [AlAwadhi and Morris \(2012\)](#) examined public attitudes and awareness regarding e-governance in Kuwait using both qualitative analysis and quantitative measurement; they attempted to identify the factors that determine the implementation of e-government construction by the government.

[Saha et al. \(2012\)](#) studied the qualitative features, particularly the website functions, navigation modules, logging linkages, and information quality of 97 municipal government websites in 21 regions of Sweden, to address system problems and information quality issues. Their results indicate that the degree of convenience in accessing and navigating websites influences the public perception of service quality; the accuracy, timeliness, and completeness of information are key indicators of service quality. Moreover, these authors suggested a theory involving the application of information systems, electronic businesses, and marketing to e-government service quality evaluations.

[Verdegem and Verleye \(2009\)](#) and [Lai and Pires \(2010\)](#) employed an acceptance model in their research. They discovered that the main indicators of public satisfaction with e-government were the perceptions of its usefulness, ease of

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