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# THE CATALYZING FACTORS OF OFFICIAL DOCUMENTS EXCHANGE VIA MICROBLOGGING IN PUBLIC SECTORS: A CASE STUDY BASED ON THE T-O-E FRAMEWORK

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## Abstract

*Since Government transparency and information open has got more attention by both academia and practitioners with the development of information technologies (IT) and Internet, The popularity of Web 2.0 application provides the government some new opportunities and challenges. Official documents exchange via microblogging (ODEM) in the Bureau of Justice, Haining is a practice case of government information open in the new media. For analyzing the determinants from academic perspective and exploring the managerial value of the case, the paper report an exploratory case study based on the technology-organization-environment (TOE) framework. After several field interviews and rigorous data coding by following the case study methodology, we find that top manager's support, personnel's IT accomplishment, and regional economic and social environment are the key determinants of the emergence of ODEM, as well as the organizational structure and operational flow is not change immediately in this case. The limitation and future goals of the study are also discussed in the paper.*

*Keywords: Microblogging, Social media, E-government, Web 2.0, TOE.*

# 1 INTRODUCTION

The popularity of Web 2.0 applications is changing people's lives through expanding the mobility and timeliness of people's communication in the virtual world. In latest two or three years, with the development of mobile communication technologies, the Microblog has become one of the hottest Web 2.0 applications. Twitter in U.S. and Weibo in China accumulated a large number of users in a short period of time. Although microblogs are now mainly is seen as an entertainment platform, it's value to organizations, particularly for governments, can't be neglected (Jansen et. al., 2009). Wattal et. al. (2010) analyzed the influence of the candidates' actions on the social networking platform level in the 2008 election results. In fact, Obama's fans far outnumber Hilary Clinton's and other competitors' on Twitter. The official microblogs of governments have grown at a surprising speed in China. Fudan University's official microblog report (2011) said there are 1708 official microblogs in China as of March, 2011. More and more government agencies and officials are setting up their own microblogs as a channel for information delivery, service notice and public-officials interaction.

In this context, this article will focus on the official document exchange via microblogging (ODEM), a milestone event in the development of official microblogs of governments in China. On April 2nd, 2011, the Bureau of Justice of Haining, Zhejiang issued a document of the relevant provisions for the ODEM, and released one official notice, the first one in China, through the microblog platform. This event has fueled a hot discussion throughout the networking society. Supporters believe that this is important progress in the opening up of government information, while opponents argue it may be little more than a publicity stunt.

Are Microblogs an important means for tightening the relationship between governments and public or not? Is a more open implementation of government information systems based on Microblogging a reality or a utopia? In order to explore these issues, we introduce the technology-organization-environment (TOE) framework (Guo et. al. 2010), in an attempt to analyze the determinants of production and promotional value of ODEM from the three dimensions, technical readiness, organizational culture and the social environment of public opinion. The study follows in the style of the case study methodological disciplines (Yin, 2003). After interviewing key persons of an event in the first instance, tracking the progress of the event and recording related comments on Internet, we conducted a series of rigorous academic interviews in the Bureau of Justice in Haining in order to collect more detailed materials for the case. The analysis results will provide some insights into the multi-level government agencies that are facing the new challenges in the Web 2.0 age.

## 2 LITERATURE REVIEW

### 2.1 Government transparency and informational openness

Transparency became an important issue after World War I in the post war negotiations (Bertot et. al., 2010a), and it means that information is freely available and directly accessible to those people who are relevant to or affected by specific government decisions (Kim et. al., 2005). It took many years for this concept to be accepted and adopted by many nations (Hardy and Williams, 2011). Currently, transparency is considered as a basic characteristic of a good government and the right to access government information is regarded as an effective way to improve decision-making and prevent corruption, which is a severe problem in many countries (Kierkegaard, 2009). More than 80 countries have established some form of freedom of information standard, and half of these were instituted within the last decade (Vleugels, 2008).

China is no exception to this trend. In early 1980s, The Chinese central government adopted a reform and opening-up policy, the disclosure of administrative rules, procedures and results have gradually been open to the public (Piotrowski, et al., 2009). The State Council of China approved the Regulations of the People's Republic of China on Open Government Information on January 17, 2007, which further systemized the transparency of governance (Ma et. al., 2005). Although government transparency has a very abundant content, informational openness is a very important part of it and it is also a very important way to realize transparency.

## **2.2 Related research issues around online informational openness**

Many scholars have studied related topics, and a series of factors have been identified to have an effect on governmental transparency and informational openness. Technical elements are among the most frequently discussed factors which affect the methods and processes of government transparency and informational openness. With the development of information technology, internet media is becoming a more powerful source compared with traditional media. The interactive and instant capabilities and the increasingly pervasive nature of internet media have been creating new ways of government transparency and democratic participation on an unprecedented scale (Bertot et. al., 2010b). From a technical point of view, there are many research efforts aimed at elucidating different modes used to realize informational openness and government transparency, including government websites (Hornig and Tsai, 2010), discussion forums (Koop and Jansen, 2009), blogs (Jackson 2006), wikis, chat rooms, geographical information systems, decision support systems, voting systems, and web and podcasts, in addition to the standard web site and e-mail services typically provided.

A series of organizational factors have been identified as having an effect on government transparency and informational openness. Studies from the website of the legislative assembly of Bahia show that the political participation by citizens affects how close governments and citizens become and it also affects subsequent trials for informational openness (dos Santos and da Silva, 2011). Despite public participation, a study of crisis communication shows that the strategic management and appropriate participation of government managers matters in a blog-mediated crisis (Jin and Liu, 2010). Another empirical study shows that whether or not an e-government promotes governmental accountability and transparency depends on the type of the bureaucracy that citizen refers to in the first place (Wong and Welch, 2004). One experiment based on the Michigan Policy Network raises the point that the ability of associated employees to translate government information for public readers makes a difference on the effect of government informational openness (Grossmann, 2011). Another study about crisis communication during Hurricane Katrina shows that that government response also matters (Macias and Hliyard, 2009). Research into political discussion forums concludes that the design and management of a forum should follow a series of rules, only in this way can the e-participation and the effectiveness of government transparency be improved (Saebo and Rose, 2010). Further study about political attitudes and behavior states that whether people are networked and the extent of interpersonal discussion affects civic participation as well as government information open trials (Zhang and Johnson, 2010).

Environment related factors are also considered to have been playing an important role in government transparency and informational openness. A cross-national study shows that competition in the global economy stimulates governments to demonstrate openness and to be more transparent (Relly and Sabhaewal, 2009). Various kinds of regulations are also part of the environment for the transparency trials of government, a study about the Freedom of Information Act 2000 examines the effect of this act on the United Kingdom Central Government's informational openness (Worthy, 2010). Changing social environments and big events also provide incentives for the government to pay attention to informational security while being open to interaction with the public, a study about Australia's National Security Information provides persuasive evidence for this argument (Rix, 2011).

### 2.3 Microblog and related new opportunities

Current technological, social, and policy landscape invites even newer ways for bridging technology, people, and government (Biber, 2009), and microblogging is the most popular one of them (Chi and Yang, 2011). There has been some research about specific microblogs, such as Twitter. Twitter is reshaping how things work in many areas, such as health care (Hawn, 2009) and education (Firriter, 2010). Twitter is also considered to be providing valuable information from the fairly complex information network (Berinato and Clark, 2010), and has made differences by acting as an 'electronic word of mouth' (Jansen and Zhang, 2009).

Twitter supporters see it as a good solution for solving information sharing problems that used to exist in the government transparency process, via either traditional media or regular internet media (Grant et al., 2010). Fluent communication flows from government to public is what microblogs can contribute, but a research about Twitter usage by U.S. congress shows that actually Congress people are using Twitter for outreach, not for improving transparency (Golbeck et. al., 2010).

## 3 CASE BACKGROUND AND THEORETICAL FRAMEWORK

On April 2nd, 2011, government website of Haining published a notice concerning the use of official documents on microblogs, aiming to carry it out inside the entire judicial system of the city. Immediately, the official microblog of the Justice Bureau in Haining released the first ODEM, which opened up a new epoch for nationwide government offices. The official notice on the microblog was firstly proposed by Mr. Jin, the director of Justice Bureau in Haining, Zhejiang province. It publishes the government documents in the form of microblog and has the same administrative efficacy as the traditional documents, which has stimulated hot discussions among Chinese 'netizens'. Jin argued that the microblog can contain 140 characters at the most, and therefore, there is little space for bureaucratise or polite formula.

After the emergence of ODEM for half a year, various comments arise from the concerned parties: the general public, mainstream media as well as related scholars. Mr. Jin puts forward that the microblog makes the government experience a feeling of working in the glass house. The backers regard it as a great trial, while the opponents hold that it is only a behavior attracting eyeball, with little actual value.

As scholars of public management, the authors of this paper are not anxious to join the either the 'for' or 'against' camps, on the contrary, we attempt to probe the implications and limitations of the ODEM on the basis of a theoretical framework of the technology-organization-environment (TOE).

The Technology-Organization-Environment (TOE) framework (Tornatzky and Fleischer, 1990) provides a widely-used theoretical foundation for organization-level investigations. According to this framework, the factors that affect organizations' adoption of new innovations fall in the following three categories:

- Technological factors: These are the technologies related to the organization, which include both technologies acquired by the organization, and technologies that can be obtained from the external market.
- Organizational factors: This pertains to the internal environment of the organization. This types of factors are usually considered in terms of organization size, centralization, formalization, complexity of management structure, employee skills, the amount of available resources, etc.
- Environmental factors: Captures the external environment, including sector characteristics, competition situation, external resources, policy, etc.

The framework has been effectively used in a number of empirical studies, such as Cooper and Zmud's (1990) work on MRP adoption and a series of e-Commerce system adoption research projects conducted by Kevin Zhu and others (Zhu et al. 2006; Zhu and Kraemer 2005). In the Chinese cultural context, Guo et al. (2010) use the TOE framework to analyze the open source software adoption in Chinese governmental agencies in a positivistic study.

The TOE framework comprehensively addresses internal factors, external factors, and the degree of integration between the technological and the organizational requirements into account. However, this is a highly generalized framework, which needs to be fleshed out with details and extended when it is applied to the examination of concrete problems. For our research with regard the possible determinants that affect the emergence of the ODEM in Haining, the framework should also be specialized and refined according to the specific context. Based on the TOE framework, we propose a model for examining those determinants, as shown in Figure 1. The model reifies the TOE framework with detailed factors drawing upon the findings of related literature, as well as field observations collected by one of the authors.

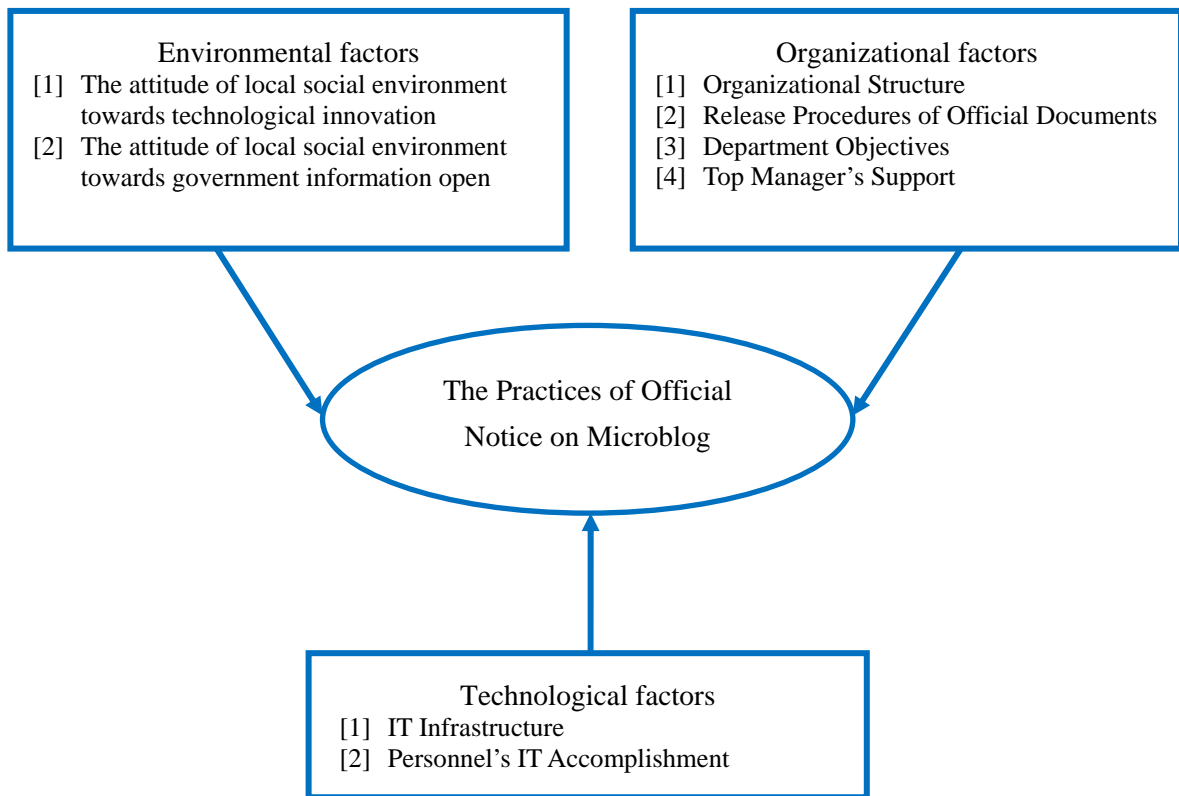


Figure 1. The theoretical framework based on TOE

#### 4 METHODOLOGY

The case study examined in the current research was conducted in the light of the theoretical model proposed above. The goal of the case study is to collect real data and understand the determinants of the ODEM in a theoretical way. As this study can be regarded as a positivistic and explanatory case study, we followed the steps suggested by a widely accepted set of guidelines (Yin, 2003) to ensure the rigor of our research.

#### **4.1 Interviewee Selection**

In order to fully understand the existing status quo and potential factors influencing Haining government agencies from different perspectives, we selected three different types of interviewees: a decision maker working in the Haining Bureau of Justice, Mr. Jin; middle-level officials in the department and the administrators of the official microblog account. Interviews with different interviewees are very helpful for data combination and cross-testing, obtaining “evidence triangulation” (Yin, 2003) so as to guarantee the construct validity of our case study. On April 14th, 2011, 12 days after the first official notice was issued on the microblog of the Haining Bureau of Justice, we got a chance to conduct a brief interview with Mr. Jin in Beijing. During the period August 3rd to 4th, one author of the paper went to Haining and conducted series of formal academic interviews with the three key types of people mentioned above, following a rigorous outline. All subsequent analyses utilize the materials from those interviews.

#### **4.2 Interview Design**

We designed at least one question for each specific factor in our model. These questions are all semi-structured. Semi-structured questions allow interviewees to control the progress of the interview, while the answers will not be biased by researchers’ subjective attitudes. These sort of questions are extremely useful when the target of the interview is to understand the unique experiences of the subject (Yin, 2003). As a supplement, we also designed one open question at the beginning and the end of each interview respectively. The one at the beginning aims to collect the most important adoption factor in interviewees’ minds, while the latter one is used to capture the factors that may not be represented in the theoretical model we proposed. In total, we designed 12 questions before hand, fully covering the factors in the three dimensions of the TOE model, and then made necessary modification for each interview in accordance with the different statuses of the interviewees. We also added some questions to probe perceptions of the case process in order to describe the case more clearly to subjects.

#### **4.3 Data Coding**

We recorded each interview both by hand and with voice recorders. Once we finished an interview, we always compiled the raw information into drafts as soon as possible. The drafts kept as many of the details that emerged from the interview as possible. If any policy or project was mentioned by the interviewees, we would check associated documents so as to better interpret the interviewees’ answers. We then coded our conversations with the interviewees into data that can be used to justify our theoretical model. Referring to Reimers and Johnston’s (2008) top-down and bottom-up patterns, this study interpreted the specific interview records and raw materials as “rationale”, and then sought to understand the case with models deduced from high-level theories. To ensure the objectivity of the data coding process, after one of authors finished coding, another author would double check the results obtained. When there was any disagreement between the two, a discussion would be conducted to reach consensus.

#### **4.4 Reliability and validity**

There are three methods to improve the construct validity: (1) to use multiple sources of evidence; (2) to construct an evidence chain; and (3) to ask key interviewees to comment on preliminary case study

reports (Yin, 2003). Accordingly, we used multiple sources of evidence in our research. In addition, the case analysis was conducted by a team composed of three researchers. As mentioned above, in the coding process, after one member completed the analysis, another member would double check the results to eliminate the inaccuracy that may be caused by one individual's subjective judgment.

Internal validity mainly focuses on whether the causal relationships or inferences in the conclusion are valid or not. Pattern Matching is an effective strategy to enhance internal validity (Yin, 2003). Pattern Matching means comparing empirical patterns with predicted models. If the theoretical models fit the empirical results, then the validity of the causal inference will be reinforced; on the contrary, if there is any inconsistency, the causal relationships will be discredited, and we need to modify the model accordingly. This is an iteration of "theoretical model-evidence-theoretical model", in which model and evidence interact with each other repeatedly. Researchers should adjust their theoretical hypotheses, and then apply adjusted theoretical hypotheses to the analyze reality. This data analysis method has some potential problems. For example, if the theoretical model ignores certain important factors or makes an incorrect assumption, then it is very likely that the important factors not included in the theoretical model and evidence that contradict the assumption will be completely omitted in the interviews. In order to eliminate the problem, although we assigned positive and negative signs to the factors in our model, the questions we designed for the interviews are mostly "whether it exerts impact on the event" and "whether it facilitates or impedes the event". By doing so, we avoid the problem that the interviewees responses are biased by our presumptions. Meanwhile, we added open questions into our interviews on purpose to capture potential factors that might be ignored in our theoretical model.

Theoretically, reliability is measured by the similarity between the conclusions derived from one case study and conclusions from another case study conducted with exactly the same research steps and the same target case but by other researchers (Yin, 2003). The major method to improve reliability is to record the study process in as much detail as possible, so that the followers can precisely duplicate this research. In our case, we made a detailed research plan, discussed it and modified it several times before the interviews. Moreover, we complete documented the entire process of the case study, including interviewee selection, interview question design, interview records, coding and data-model mapping.

## 5 CASE ANALYSIS

### 5.1 Case Description

Before discussing the determinants from technology, organization, and environment perspectives, we tried to describe the process of the case firstly (Please see Table 1).

Time Dimension	Schemes	Description
Before the event	Clue Generation	First, the officials' personal microblog fails to substitute entirely the role of authoritative counterpart from the governmental departments;
		Second, general public require of the further administrative open of the government;
		Third, the authoritative microblog should not only act as channels to reflect opinions, but also bear some other contents.
	Preparation	Firstly, the holding of teleconference, the survey of grassroots departments and an informal discussion with small size mainly aims to make justice bureau acquaint with the operational regulation of microblog and official document.



During the event	Release Process	Firstly, administrative or technical offices are responsible for making a draft;
		Secondly, leaders who are assigned personal responsibility for it examine and verify so as to ensure the legal validity of the official documents;
		Thirdly, the specially-assigned person takes charge of publishing microblog.
After the event	Working Experience	First at all, “official documents on microblog” make the governments acquire timely more feedback and suggestions from general public. And meanwhile, justice bureau itself regulates part of their works in accordance with feedback from microblog;
		Responding to netizens’ questions must be cautious;
		Lastly, there is a group paying attention to the work of Haining Justice Bureau centering on official microblog, but at present, the participants are not enough.
	Positive Feedback	First, the netizens consider it fresh and put forward a great number of suggestions, among which positive feedback takes a crucial place;
		Second, mainstream media pay close attention to it, and the affirmation of the People’s Daily fixed the keynote;
		Third, the leaders know and make comments frequently, and the people of the same occupation regard it as information highland and make research into it. Chen Shengyong from Zhejiang University of Technology: Sublime words with deep meaning. Song gang from Beijing Municipal Bureau of City Administration and Law Enforcement: E-government Affairs in Web 2.0 Era.
Negative Feedback	Some specialists engaged in public sentiment research are suspicious of the practice and experts from Scientific Socialism Research Institute hold that “being fashionable may not necessarily work”.	
Practice Feedback	Some regional governments begin to take a shot at “official documents on microblog”, including Nanhai District of Foshan City, Jinhua City Committee Organization Department, and County League Committee of Daishan County.	

Table 1. Process description of the Case

## 5.2 Results and Discussion

Mapping relationships between factors and coding tags are summarized in Table 2. The 1st column of the table lists all the factors in the model. The 2nd column lists the observation schemes generalized from the data items. The 3rd column lists the empirical viewpoints from which a certain factor gets support. Due to limited space, we do not enumerate all the tags; instead, we listed only the positive (+), negative (-) or no specific influence (n) of supporting tags and the conclusions for each factor.

Framework Elements	No.	Schemes	Empirical Viewpoint (Tags)
Technological Factors	T1	IT Infrastructure	The emergence of ODEM is on the basis of the development and wide application of information technology. (+)
			The developmental level of traditional IT facilities exerts little influence on boosting “official documents in microblog”. (ns)
	T2	Personnel’s IT Accomplishment	Personal access to microblog is the precondition of the appearance of ODEM. (+)
			It is easier to advance in departments with more young people. (+)
Organizational Factors	O1	Organizational Structure	Great adjustment doesn’t happen on the organization structure of Haining Justice Bureau before and after the release of ODEM. (n)
			The people in existing structure have microblog, which makes liaison between organization nodes in microblog world expedite. (+)

	O2	Release Procedures of Official Documents	The publishing procedure of ODEM is similar to that of the traditional official documents. Generally speaking, the official documents should be signed and issued by director Jin (the first chair), while the leader who is in charge of ODEM is granted to do it. (n)
	O3	Department Objective	To popularize laws is the important obligation of the Justice Bureau, which requires enhancing interaction in various forms with citizens. (+) As a new form of media, the characteristics of microblog are in accordance with the developmental requirements of Justice Bureau. (+)
	O4	Top managers' support	Both standpoint and awareness of the first chair is vital. (+)
Environmental Factors	E1	The attitude of local social environment towards technological innovation	In Haining city, the people's thinking is active and they are quick in accepting new things. (+) The innovative soil is of great importance. (+)
	E2	The attitude of local social environment towards government information open	Social civilization is high and people have high demand on information open. The government is confronted with great challenge. (+)

*Table 2. Summary of Mappings between Factors and Data Items*

In terms of the technological viewpoint, the influence of the IT infrastructure level may be derived from a more macroscopic dimension, that is; the social informationalization level creates technological environment for ODEM. While in the organizations, the IT infrastructure level does not show specific influence on the emergence of ODEM. Compared to the factors above, the personal IT aptitude, particularly the familiarity with such web 2.0 applications as microblogs, is more important. For example, the director of the bureau, Mr. Jin has a high aptitude for IT and holds a high opinion of microblogging, which is not common among contemporary government officials with most of the government heads of department being older than Mr. Jin. Hence, it constitutes an accidental factor in this case.

With respect to organization, there is lack of special adjustment on the part of organizational structure and the release procedures of Haining Justice Bureau concerning ODEM. However, the timeliness of ODEM requires of a simpler set of approval procedures. While doubtlessly, the official notice released by means of microblog is less important and not all official documents will be published through the medium of the microblog. Although the emergence of "official notices via microblog" in the Justice Bureau may more or less be attributed to the overall orientation and specific targets of the department, but Mr. Jin's zeal for it appears more closely related and it has been mentioned many times in the prior study on informationalization. At present, the support from the head of department still plays a key role in the pursuit of innovation in Chinese government departments.

Concerning environment, Haining city is located in Zhejiang province, a coastal area just south of Shanghai, and its general level of economic development is higher than the Chinese average and consequently the general public here are more engaged; generally quicker in accepting new things and have higher expectations from their political and cultural lives. This prevailing objective environment enables the ODEM to acquire more support and encouragement from the local government and the public. And in the meantime, Mr. Jin, as a veteran user of microblogs, is also capable of winning support through the manipulation of the network consensus. These factors combine to broaden the environmental domain, affecting the shift in affairs along with the global trend brought about by the network society.

## 6 CONCLUDING REMARKS

Generally speaking, our main conclusions involve the following points. First, many analyses conclude that the implementation was ultimately due to Mr. Jin's personal aptitude and zeal, which to some extent reveals the uniqueness of the case. Although the average age of government officials in China is gradually falling, they typically have less of an understanding about of the rising 'network society' than the Mr. Jin. This unfamiliarity may lead to persistent ignorance or even fear. One of the authors of this paper once made the students of government departments discuss in the classroom the case of ODEM. Many of them argued that the action may be risky, but they failed to point out where the risks actually exist. The current situation is possibly the main obstacle to the large-scale rolling out of ODEM across China. Second, the release of the ODEM made no difference to the organizational structure and operational flow of the department. It only acted as a "tool" rather than an output in and of itself. Hence, many of the problems encountered in the networking stage of informational openness by the Chinese government are hardly resolved with the emergence of ODEM. Although there has been positive responses to the effects of ODEM among the Justice Bureau of Haining city, the risk of it becoming a mere formality after its popularization cannot be ignored. Third, the influences of economic and social environment exerted by the special territory of Haining city cannot be neglected. The imbalanced development of some Chinese regions requires us to consider more cautiously the popularization of this mode of communication in more places.

Even so, we have to admit a fact that the ODEM only appeared half a year ago and it is still in the experimentation. For example, there is a lack of a definite mechanism to ensure that netizens can join in the decision process of the subsequent official documents. Similarly, our research is only in the initial stage. The results from the single case of Haining Justice Bureau can be only partially conclusive, rather than definitive. In a subsequent study, we, on the one hand, will attempt to follow and analyze some areas and departments which have only recently decided to take a shot at ODEM, so as to infer from multiple case studies. Concurrently, we will seek and compare with similar public management trials in countries. We argue that this research and the practice that is based upon it are conducive to promoting China's shift towards a more sophisticated government that fosters informational openness and a greater degree of interaction between government and citizens.

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