

## Research Article

# The Influence of Website Type and Design on the Transparency of Government Websites: The Empirical Studies Based on the 126 County Government Websites of One Western Province in China

<sup>1</sup>Ye Zheng, <sup>2</sup>Hongbo Li and <sup>3</sup>Zhiyi Wang

<sup>1</sup>School of Management, Xi'an Jiaotong University, Xi'an 710049, China

<sup>2</sup>School of Public Policy and Administration, Xi'an Jiaotong University, Xi'an 710049, China

<sup>3</sup>Xi'an Modern Control Technology Research Institute, Xi'an 710049, China

**Abstract:** Taking 126 county government websites of one western province in China as samples, the influence of website type and design on the website transparency was investigated deeply through using the chi-square test and optimal scaling regression, accompanying with the real-time measurement of the website transparency. The study results showed that: obvious differences were observed for transparency of government websites with different types. The transparency of county government official website was higher than that of county education website and county agricultural information website. Two indicators, website columns and the website accessibility have a significant impact on the transparency in website design dimension. However, there was no significant correlation between the website functional navigation and the transparency. In addition, the county economic development (GDP) also was identified to have a significant impact on the transparency of websites. Therefore, scientific and reasonable suggestions may be offered for the referenced staff based on the above investigation results.

**Keywords:** County government website, transparency of website, website design, website type

## INTRODUCTION

The center for public participation studies and supports of Peking University released a report about the administrative transparency observation of China (2011-2012) at September 28, 2012. This report revealed that county government has an overall poor transparency with the observation and comparison on transparency for 72 provincial administrative units, 88 prefectural administrative units and 38 county administrative units in China. The passing rate of transparency was only 26.3%, which means that the passing rate of transparency for county government was less than 30%. What reasons lead the transparency of county government in a so low value? What are the factors that may affect the transparency of county governments? What method can be employed to improve the transparency of the county governments? With the release of this research report, these questions have gradually become the current focus of the academia and the public staff.

Present research shows that transparency has gradually become an important factor in affecting the societal governance (Mitchell, 2011), basing on the concern content in international transparency practices, "the internet has greatly reduced the cost for government to collect, publish and obtain information" (Roberts, 2006). Along with the government will be more and

more information is posted to the website, the trust of citizens to government institutions and leaders were observed to rise gradually (Tolbert and Mossberger, 2006). In order to realize the concept of "good governance" in the public administration, the urge of transparency and the reform of public accountability system are needed (Bonson *et al.*, 2006). The transparency of the government is particularly concerned by the public, because of the transparency reflects the information openness in government's policy-making process (West, 2004). Coglianese (2009) hold that transparency showed helpful to assist government administrant and to build a communication bridge between public policy makers and the public and to avoid the abnormal administrative action for administrative staff through increasing the external threats and public oversight. According to Armstrong (2011), the transparency of government can be evaluated through testing the effectiveness of public records on the government website (Armstrong, 2011). The grade of government websites is directly determined with the number of information accessed by public and the attitude of political participation for public (Reddick and Frank, 2007). For example, a poorly designed website will often make users frustrated and cause them to leave because they cannot find the useful information they need. In addition, if the content is designed excessive loose and lack of a center, messy, this will directly affect

the degree of public interest and convenient extent to access information (West, 2004).

The government portal website, acting as the representation for public service in information era, plays a leading role at the electronic government. Furthermore, it is not only an important window for the government for providing public services to the community, but also the important platform for public and government to communicate (Liu *et al.*, 2009). In view of this, we examine the administrative transparency with our attentions on the government website, specifically those 126 county government websites of a western province in China. The empirical study on the construction degree and information transparency record for three types of county government websites, including official website, education website and agriculture website, are demonstrated to verify the significant influence of website type and the website design on the transparency of website? Combining with the empirical research findings, this study aims to provide scientific and reasonable policy recommendations to improve administrative transparency for county government.

## REFERENCE REVIEW AND RESEARCH HYPOTHESIS

**Website type and the transparency of websites:** A similar definition about the concept of transparency was used for current academic staff, but scholars also give transparency with the characters of clarity, accountability, accuracy, access and fidelity. Transparency was recognized as one of the important parts for good governance (Weber, 2008). In the information age with the booming development of electronic government, the investigation of the transparency for government websites tend to evaluate the degree of information disclosure on the government website (i.e., all the available information about the effectiveness of the records). There exists difference for government website construction in different regions, different types of government agencies. Therefore, the present study is demonstrated based on the perspective about the nature of the government agencies, functions difference and regional types.

Many researches on the relationship between the website type and the transparency of website have been done. West (2004) pointed out that there was significant difference on the information content and the openness ability for different local government websites. Such as, obvious difference of public retrieved and available of information supported in website between rural and city government websites, the disappearance of the negative information (low enrollment rate) on the local education websites, the difference of functions between the government departments also affected the availability of online public information. In addition, Schedler and Summermatter (2007) have found that there was a greater difference on the information service supply quality to meet the needs of citizens for different type

government websites. Those websites focused on meeting the needs of citizens abled to provide more high-quality, efficient and convenient electronic services and information recording. Armstrong (2011) also found that the website type have a significant influence on the public information transparency of websites through investigating and comparing the 67 county government websites and corresponding county education websites of 67 Florida. Higher transparency was observed for county education websites than that of the county government websites.

Therefore, in this study hypothesis 1 is represented:

**H1:** Website type shows a significant influence on the transparency of websites. That is to say, there is significant difference on transparency of website for different type of government websites.

### **Website design and the transparency of websites:**

West (2007) pointed that the ultimate goal of government website is to achieve publicity; website design should show the best visual effects. In addition, its architecture should be also to provide more efficient information retrieval and access channels for visitors. Such as: e-mail, search engine and personalized function set, which all means a higher level of publicity, government departments should make use of these tools to promote the website to access facily. Gretanasi *et al.* (2011) scholars have pointed out that the usage of information communications technology to deliver information and services has become an important indicator to achieve the modernization agenda for government departments. The published information can be more accepted and understood by social for a top electronic government website, which can equal the government officials interests and the citizens demand (Moon and Welch, 2005). Thus, website designer should take into account the needs of different groups of users in the process of the website construction (Smith, 2001). Therefore, above mentioned studies verified that professional government website (professional website designer and staff are needed likely in the government departments) can not only provide more easy-to-use information or the public, but also has a high public propaganda level with a higher website transparency. Herein, hypothesis 2 is represented:

**H2:** Website design shows a significant influence on the transparency of websites. That is to say, higher professional website shows a higher transparency.

Previous studies have identified the variety of factors that needed to be considered in the design of website. And scholars investigated the dimensions of the website design in detail from different perspective. Spool *et al.* (1999) and Nielsen (2000) identified the factors, including usability, navigation, credibility of content quality, integrity and the correlation needed to be considered in the website design. West (2004) proposed the three important factors in website design

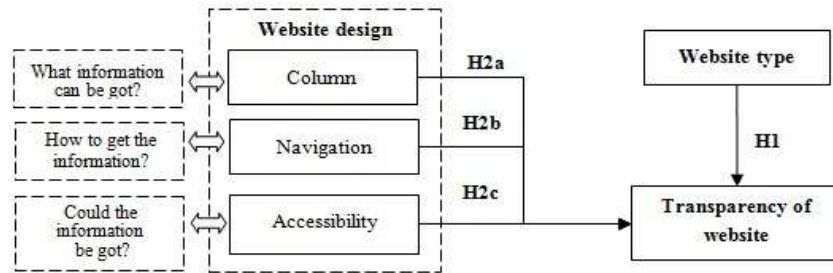


Fig. 1: The scheme of influence of website type and design on the transparency of websites

are information availability, service delivery and public access. In addition, excellent design website will directly affect benefits of the online sales for those electronic retailers, who need to rely on the internet for sales (Fortune, 2000). This was mainly resulted from the poor updates speed of website information, the great difficult for information use and the difficult in information search and other factors (NUA, 2002). In order to attract users, navigation features should be established in the website design to help users find their needed information, then to improve their satisfaction (Abdelmessih *et al.*, 2001). Palmer (2002) point out five measure indicators for website design (availability): website access speed, navigation, column settings normative, interactivity and responsiveness (feedback of user and FAQ). Therefore, there are a large number of scholars have done deep studies on the website design. According to the summary and interpretation of the existing literature, the website design dimension is divided into three aspects by taking into account the reality operability: website column (what information you can get), website navigation (how to get this information), website accessibility (can you get this information). Based on this, the study further proposed with following hypothesis:

**H2a:** Website columns shows a significant influence on the transparency of websites.

**H2b:** Website navigation shows a significant influence on the transparency of websites.

**H2c:** Website accessibility shows a significant influence on the transparency of websites.

Combined with above reference review and the research hypothesis and the reality situation, Fig. 1 represented the investigation scheme.

## RESEARCH METHODOLOGY

**Origin of samples:** In this study, the county government websites of a western province in China were used as the investigation samples. The website transparency (public information record) of these county government websites evaluated with the method of website real-time measure. Samples collected mainly

include the following aspects: First, according to regional classification, the all counties of S province divided into three regions in central, south, north. 14 counties were selected from each region and the total counties were 42. Then according to the government administrative functions different, these selected country websites were divided into three groups: the county government official website, the county education website, county agricultural information website. Finally, actual access was operated to confirm the existence of the categories websites for 42 counties. If there was no (or sites not open) these websites, the selection of the other counties to be replaced and finally we get to the total number of web sites was  $14 \times 3 \times 3 = 126$ .

**Measurement:** The measure time of this study was 6 August to August 26, 2012, total of 21 days. The specific procedure as following:

- One hundred and twenty six websites were classified and divided into three areas with 42 websites per area. Then the 42 websites were further divided into two groups for each area. Week was selected as timing units, the top 21 websites of one area was observed in the previous three days while the remainder 21 websites of this area was observed in the after three days and the last day was arranged to summarize and organize.
- In general, three weeks were took to measure total 126 websites, the first week was arrange to evaluate the 42 websites of one area, the next week was arrange to evaluate the 42 websites of other area and the third week arranged for the last area.
- Seven websites were observed at night from 7:00 to 9:00, the main attentions can be focused on the statistics of information recording, announcement quantity, column setting.
- Each evaluation didn't use any of the search engineers available on the website; just clicked the information link under the local settings, emphasized on the availability of information recording. The average access time was controlled about 10-15 min time for each website.

Table 1: Variables and their descriptions

Variables	Definitions and description
The dependent variable	Transparency of website
The independent variables	Website type
	Websites columns
	Websites navigation
	Website accessibility
The control variables	Regional classification
	County population
	County population

**Variable recognition and measurement:**

- **The dependent variable:** In the present study, the transparency of website was the dependent variable. The evaluation of the transparency of website mainly based on the relevant requirements of “the suggestions of the General Office of the State Council on strengthening the construction and management for government websites” and “the suggestions of S province on strengthening the construction and management for government websites”. The presence or absence of commonly used information record on the website was paid especial emphasis (presence = 1; absence = 0). For the compare analysis, 12 types of information recording were selected and indicated: the sector overview (GKGL), the institutional setting and leaders introduction (JGLD), the local regulations, rules and other regime files (DFWJ), the personnel appointment and removal (RSRM), the notice (TZGG), the news (XWDT), the public opinion feedback (YQFK), the office statistics (BGTJ), the government procurement and investment (CGYZ), the budget (CZYS), the acting guide (BSZN), the website navigation (WZDH). In this study, these indicators were employed in frequency statistics to evaluate the transparency of the websites.
- **The independent variables:** In this study, the government websites type and government websites design were independent variables. First, the government websites type was classified into three categories: county government official website = 1; county education website = 2; the county agricultural website = 3. The differences in transparency between different types websites was confirmed through the descriptive statistical analysis. Then, the measurement on government website design, which was divided into three dimensions: websites columns, websites navigation and websites accessibility. Furthermore:
  - Websites columns was evaluated mainly by the presence or absence of website video and audio, news release pages, websites navigation, the commonly service link (presence = 1; absence = 0).
  - Websites function navigation was evaluated mainly by the presence or absence of specific information

recording search engineer and the information recording list (presence = 1; absence = 0).

- Website accessibility was evaluated through the difficulty degree of visit, the ease of access information evaluation and the update speed website information, 1-5 represents accessibility descending, 1 = very easy; 5 = very difficult.
- **The control variables:** In this study, the regional classification, the county population, county economic development (GDP) is control variables. Region classification is the divination of central, southern, northern three areas about all the county, county population is inquired from the "S province 2011 statistical yearbook", the county level of economic development (GDP) can be set for excellent, good, fair and poor in four grades, which is inquired from the “S 2011 Statistical Yearbook” to grade the GDP for 42 counties in this study. The previous 25% is ranked as excellent, ranked in between 25 and 50% as good; the rest may be deduced by analogy. Variables and their descriptions are shown in Table 1.

**RESULTS AND ANALYSIS**

**Frequency analysis and chi-square test:** One of the problems of the present research is the clarification about the significant differences in the transparency websites for different types. Table 2 shows the information record type distribution available on different types of government websites, the highest proportion is the notice (TZGG) (94.38% for the government official website, 91.27% for the education website and 93.51% for agricultural website, respectively), following proportion is the news (XWDT) (92.67, 93.68 and 92.77%, respectively for the three types of websites, respectively) and the local regulations, rules and other regime files (DFWJ) (93.45, 90.23 and 89.64%, respectively for the three types of websites, respectively). In addition, we found that the lowest proportion of information record are the personnel appointment and removal (RSRM), the public opinion feedback (YQFK) and the budget (CZYS) for the three types of websites, their proportion in the three types of websites is very different.

Table 2: The frequency of available information record for different type county government website and the chi-square values

No.	Information record type and indicator	Government official website (%)	Education website (%)	Agricultural website (%)	Chi-square value
1	GKGL	96.03	84.92	81.75	2.03
2	JGLD	91.04	88.67	83.43	0.78
3	DFWJ	93.45	90.23	89.64	0.32
4	RSRM	43.23	21.46	13.78	4.17*
5	TZGG	94.38	91.27	93.51	0.21
6	XWDT	92.67	93.68	92.77	0.06
7	YQFK	61.73	42.33	26.78	4.63**
8	BGTJ	73.25	66.81	63.24	1.37
9	CGYZ	77.34	13.25	16.91	7.98*
10	CZYS	76.63	27.38	8.53	7.33*
11	BSZN	84.12	76.22	71.24	1.64
12	WZDH	80.67	77.39	74.27	0.26
Total		964.54	773.61	715.85	-

\*\* : A significant level of  $p < 0.05$ ; \* : A significant level of  $p < 0.1$

Table 3: Standardized partial regression coefficients and their significance test

Variables	Standardized coefficients		df	F	Sig.
	Beta	S.E.			
Regional classification	-0.014	0.019	1	0.562	0.413
County population	-0.025	0.136	4	0.381	0.765
GDP	0.026	0.087	2	2.637	0.093
Website type	0.137	0.033	2	4.116	0.007
Website columns	0.034	0.029	1	3.015	0.064
Website navigation	-0.007	0.012	1	0.218	0.692
Website accessibility	0.293	0.021	3	6.531	0.004

S.E.: Standard error

According to the two-stage model for the development of electronic government proposed by American scholar (Christopher, 2004), that is information dissemination stage and online transaction phase. Form the results we can conclude that the current development stage for the county government websites of S province is still in the stage of information dissemination, which is the development stage of electronic government, the first (primary) stage.

In order to identify the difference of transparency between government official website, education website and agricultural website, the chi-square test (Chi-square Test) was demonstrated on the information public record for these three types of websites. The significant difference was observed for the personnel appointment and removal (RSRM) ( $\chi^2 = 4.17$ ,  $p = 0.093$ ), the public opinion feedback (YQFK) ( $\chi^2 = 4.63$ ,  $p = 0.036$ ), the government procurement and investment (CGYZ) ( $\chi^2 = 7.98$ ,  $p = 0.072$ ) and the budget (CZYS) ( $\chi^2 = 7.33$ ,  $p = 0.083$ ) of these three type websites. These differences may be due to the difference in the nature of study and administrative functions for different government units. Therefore, considerations were focused on the nature of the study and functions of itself as the website information was released. Table 2 reflects the difference in the availability information record for different type government websites. Furthermore, the availability in information record for government official website is higher than that of other two types of websites.

**The optimal scaling regression analysis:** The variables involving in this study are a considerable part of the classification data, thus, we can use the optimal scaling regression method to fit the classification data.

PASW 18.0 software is employed for the optimal scaling regression to evaluate the influence of seven variables on the transparency of website. Table 3 represents the standardized partial regression coefficients and their significance test. It is found that, the website type and the website accessibility pass the inspection with a 5% significant level ( $p < 0.05$ ); For a 10% significant level ( $p < 0.1$ ), the county economic development level (GDP), website columns set pass the inspection, while the regional categorical variable ( $p = 0.413$ ), county population variable ( $p = 0.765$ ) and the website function navigation ( $p = 0.692$ ) failed to pass the inspection. The above analysis shows that four variables including county economic development (GDP), website type, website columns and website accessibility have a significant effect on the transparency of websites. However, the regional classification, the county population and website navigation show little influence on the transparency of website. Therefore, the above mentioned hypothesis H1, H2 (a) and H2 (c) are right, while H2b is incorrect.

Table 4 represents analysis results of the zero correlation coefficients, partial correlation coefficients, part correlation coefficients, the importance of correlation coefficient and the tolerance of correlation coefficient for each independent variables and the transparency of websites (the dependent variable) in detail. First, the correlation analysis includes three results, the partial correlation is the evaluation after controlling the influence of other variables on the dependent and independent variables; part correlation just control the impact of other variables on the independent variables. Secondly, the degree of

Table 4: The correlations and tolerance for variables

Variables	Correlations				Tolerance	
	Zero order	Partial	Part	Importance	After transformation	Before transformation
Regional classification	0.063	-0.008	-0.003	-0.003	0.879	0.826
County population	0.055	-0.015	-0.011	-0.012	0.931	0.906
GDP	0.194	0.029	0.023	0.182	0.839	0.776
Website type	0.318	0.047	0.041	0.294	0.714	0.688
Website columns	0.201	0.033	0.027	0.207	0.632	0.598
Website navigation	0.081	-0.003	-0.001	-0.000	0.945	0.926
Website accessibility	0.493	0.196	0.164	0.331	0.633	0.568

importance mainly is evaluated by the degree of importance of the independent variables calculated according to the standardized coefficients and correlation coefficients, the greater the value, the more important for the prediction of the independent variables to the dependent variable. In is shown that website accessibility, website type significant and website columns have the most obvious effect on the transparency during these test variables through standardized coefficient. This indicates that the construction of government websites, optimization of website content and structure and maintain and update website page and links should base on the specific functions of each unit. The further improvement for website information transparency was realized by strengthening the construction of government websites. Third, the tolerance represents the proportion of influence of one variable on the dependent variable, which is not be explained by other independent variables, the larger the better. As can be seen from Table 4, the tolerance of the variables is maintained at 0.6 or higher, showing that the variables exists smaller collinearity. In summary, the above mentioned analysis shows that the optimal scaling regression in this study is excellent.

### CONCLUSION AND DISCUSSION

This study evaluated the transparency of 126 county government websites of one western province in China, the obtained conclusions as following:

First, there are significant differences in transparency for different types of government websites. Through the real-time measurement and comparison study of county government official website, county education website and county agricultural website, the availability of information record for county government official website is higher than that of county education website and county agricultural website. In addition, the public information on the news (XWDT), the notice (TZGG) and the local regulations, rules and other regime files (DFWJ) has the highest transparency for these three categories website. Following transparency are the sector overview (GKGL), the institutional setting and leader’s introduction (JGLD), the website navigation (WZDH) and the acting guide (BSZN). The lowest transparencies are the personnel appointment and

removal (RSRM), the budget (CZYS) and the government procurement and investment (CGYZ). This study found that the information publication for county government website needed to be strengthened, especially for the critical government information, which has an important role to improve the government credibility and to enhance public political trust.

Second, different effects for the website design dimensions on the transparency of website were observed. The influence of the website columns and the website accessibility on the transparency of website is significant and the strong correlation between website accessibility and transparency was recorded while the website navigation has little influence on the transparency of website. The results presented in this study illustrate that improvement of website design is an important technical method to improve government transparency in information disclosure and to strengthen the interaction between the officials and the public. Based on the “serving the public”, we should simply the website architecture, provide more interest information and services for public, inspect periodic, maintain and update website pages and related links to facilitate public login and access important information timely.

Third, the control variables involving in this study have a significant effect on the transparency of website except the county economic development (GDP). The county population and area classification show a non-significant correlation with the transparency of website. This study found that the higher economic developed level areas may pay more attentions to promote electronic government websites and to increase investment in information construction. This is mainly owing to the close relation between the economic develop level and the information building, the information technology level has a significant role in promoting economic development.

Fourth, this study found that the information classification is confusion during the real-time measurement process for all county government websites, even some of them set different information bulletin, such as the lack of uniform standards, the nonstandard of column name, the inconformity of name and the content, the lack of timely update for information, the non-accessibility for some commonly service link, the wide difference of between the publican information and the public interests and needs.

With the above analysis and discussion, the following aspects can be carried out to improve the transparency of county government website: Firstly, difference in policy and tactics should exist between different types and different areas websites in the improvement of government websites transparency, basing on the "people-oriented, highlighting features, according to local conditions, according to change" website construction concept; Secondly, taking public demand as orient to optimize website column design, to set columns scientifically and rationally, to update information content speedily, to increase convenient service channels, to enhance the public enthusiasm, to inspect and maintain the web page and various types of commonly used link regularly and the to enhance the total information publicly ability of the county government website overall; thirdly, increase support and investment strength for the relative lower economic develop level counties in constructing information websites. All the county government should actively learn advanced website building experience to constantly enhance the ability of the website construction and to further promote the website information disclosure practice.

This study demonstrated the investigation on the evaluation of the transparency for county government websites, the drawbacks are still exist as following: Firstly, the evaluation of transparency presented in this study is only based on the statistical observation of the quantity for available information record on the web, without the comprehensive audit for the quality of the information. In fact, the information quality and transparency also has a closely relation; secondly, the types of government websites, three types government websites were limited according to the nature of government departments and administrative functions in this study. However, the division of government websites actually includes a variety of other possible situations. Therefore, the results obtained cannot represent the transparency for all types of government websites; thirdly, samples in this study only obtained from 126 county government websites of one western S Province, which is relatively small, the results may not suitable for a wide range situation. Therefore, future studies should be carried out on above mentioned three aspects.

### RECOMMENDATIONS

With the above analysis, we can clearly recognize the website type and website design have significant influence on the transparency of website. In addition, the county economic development level (GDP) as a control variable also has a significant effect on the transparency of websites. This conclusion is well agreeable with that reported by Neal *et al.* (2007) and others. This may be because of that the higher economic level developed areas pay more attentions to promote electronic government websites and to increase

investment in information construction. However, it is hard to find the correlation between the website navigation and the transparency of website. Although Alkindi and Abdelmajid (2010) found that website with navigation and search system can help students faster access their needed information through comparing two different academic, it is hard to conclude that a website with navigation system will show a greater transparency. As mentioned above, the academic concept of "transparency" has no unified definition. In this study, we defined the transparency as "the direct observation and access to available information record". In this study, search engine is not used for the website real-time measurement process, instead of observing the existence of the information record by directly click access link. This indicates that we can still get to the information even if we not use the website navigation function. In other words, website navigation determines the speed of access to information, but there was no significant effect on the accessibility to information.

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