

A Survey on E-Government in Chinese Construction Industry

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Abstract

Government informatization engineering has been built since 1999 in China. In order to push the use of IT in the construction-related agencies and be consistent with the whole national e-government, "one parts of e-Government system~ the system in the construction industry" began to build in 2003. Two years passed, what is the actual state of e-Government in the construction-related agencies now and what were the perceived benefits and questions? And how will e-Government in the construction-related agencies develop in the next years? The latest survey which was carried in Aug., 2004 answered the above questions. The survey results showed that the construction-related agencies had rapid progress in building e-Government system. Based on the survey, this paper compares e-Government in construction-related agencies in big cities with that in SM sized cities and analyses the cause. At last it pointed out that it is very important that construction-related agencies in provinces and districts should keep developing e-Government to impel those in counties to improve and operate e-Government systems in the next process of building and operating e-Government in the construction-related agencies in China. And e-office work should be taken into considered firstly. For the agencies in SM sized cities, the finance mode should be increased.

Keywords

Survey, Information Technology, E-Government, Construction Industry

1. Introduction

It is one of the development stratagems to improve the development of traditional industries with the innovative application of information technology (IT) since 10th Five-Year Plan in China. And to promote application of IT in government agencies, "National Information Management Panel: Advice on Chinese E-Government" were presented in 2002. Then "one parts of e-Government system~ the system in the construction industry" began to build, which has been led by the Ministry of Construction in 2003. This

system will connect with thousands of construction-related government agencies in 660 cities and more than 10 thousand enterprises in construction industry.

This survey tried to know the current state and questions in building and managing e-Government systems in whole construction industry.

2. Methodology

According to the economy development level and style, these cities in China are divided into big and SM (middle and small) sized cities. The big cities include four cities directly under the jurisdiction of Chinese state and 14 cities of subsidiary province, such as Beijing, Shanghai, Tianjin, Chongqing and Dalian et al. The others are SM sized cities. In this survey, the samples were split in two categories, which were separately those in big and SM sized cities.

The survey was sent by mail to a statistical sample of 230 from 675 of total agencies in the construction industry across China, covering 31 provinces and metropolis. The sample was selected at random in order to ascertain reliability. However the sampling size was low, the results could also be used as an indicative guide for this industry in general. The survey questionnaire contained 54 multiple choice questions, and it began in Aug., 2004 and ended in Feb., 2005. Participation to the survey was voluntary. Dispatch and receive of questionnaires were done by the officer in charge of the application of IT in the Ministry of Construction, and the analysis was done by the research department, so the results were kept confidential and used for statistical purposes.

Although another survey (Ma Z.L and Gu W.H., 2004) was carried, this survey emphasized the contrast between agencies of two levels. So this survey will help national IT development panel and the Ministry of Construction to determine the next development direction.

3. Respondent Profiles

81 units of the 230 questionnaires responded and the response rate was about 35%. 89% of the respondents were senior management, others were IT managers. In general, a mail survey cannot be considered statistically significant under a 50% return rate (Erdos, 1983). But the return rates for mail surveys in the construction industry oscillate often around 10 % (Rivard, 2000), so even though a low-response was obtained, the findings of the survey still presented useful information in the building and operating e-Government.

4. Analysis on the Returned Responses

Based on an overall 35% return rate, the analysis presented here included computers, software, network, investment, current function of e-Government, the demand factors analysis and the barrier.

4.1 The Status of Computers

Computer availability is the pre-requisite of e-Government. In the respondents, 69% were “one computer per person”, 6% were “one computer for two persons”, and 25% were “one computer for three or more people”. Table 1 showed the status of desktop computers for agencies in the construction industry in both big and SM cities surveyed. The agencies in big cities had more desktop computer than that in SM cities probably because they kept old computers longer. It was clear the quantity of desktop computers that had employ time for 1-3years in big cities was less than that in SM cities, but that of 3-5 years in big cities was

more than that in SM cities. It clearly indicated that the things of computers in big cities were better than those in SM cities. And it showed computers are becoming work tools for all officers in construction industry.

Table 1: Statues of Computers

	Categories	Agencies in Big cities	Agencies in SM sized cities
The set-up of Desktop computer	One per person	86%	56%
	One for two persons	14%	0
	One for three or more peoples	0	44%
Years for Desktop computer used	For 1-3years	57%	67%
	For 3-5years	43%	33%

4.2 The Usage of Software System

The results in figure 1 generally showed that all agencies surveyed had used OA. Finance management system and document management system take second place. Except for data mining, it shows the usage statues of software in agencies in big cities are better than those in SM cities. The reason is probably that data in construction industry is mostly from the underling management agencies.

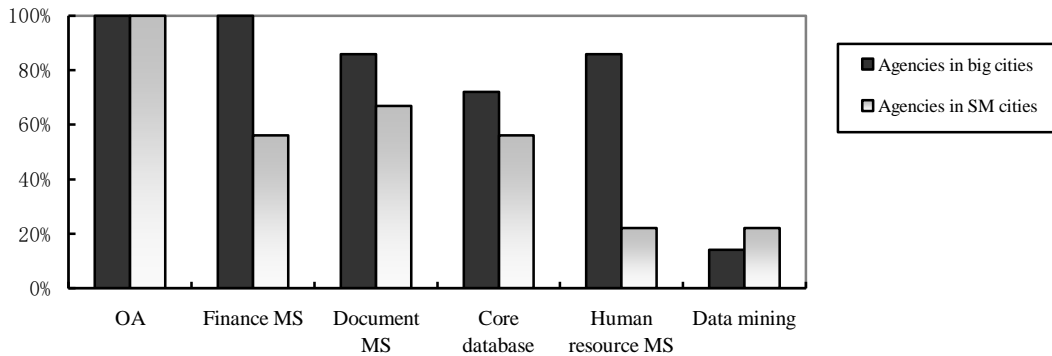


Figure 1: the Usage of Software System

4.3 Networks and Communications

The advent of networks provides phenomenal opportunities for communication and data exchange. Wireless network can help make public information and government services available anytime and anywhere. In the respondents, 88% have established LAN including all agencies in big cities and 78% agencies in SM cities, 94% computers were connected to Internet, including all computers in agencies in big cities and 89% in SM cities (see as figure 2). It also showed DDN and optic fiber were main types of connections to Internet, while most agencies in SM cities applied ADSL and optic fiber. The exit speeds varied from 2M up to 10M. Only 10% in big cities had wireless network, which showed the wireless network remained preliminary phase.

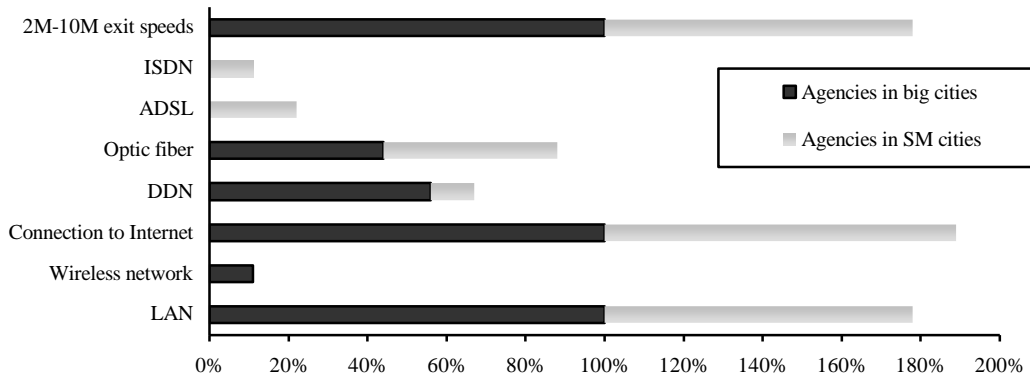


Figure 2: the Statuses of Network

4.4 The Investment

In the beginning of e-Government, the investment is indispensable. The aspects of investment discussed here included the amount and source. Figure 3 separately showed the investment amount of the agencies in big cities and SM cities in the past 3 years. Obviously the investment amount in big cities was higher than that in SM cities. The percent of the investment from RMB1 million to RMB5 million was 43% in units in big cities, while the percent of the investment from RMB100 thousand to RMB0.5 million was 47% in units in SM cities, the money of the front was almost 10 times as that of the latter.

Figure 4 showed the capital source of building and operating e-Government. It showed that the state budget was basic source in SM cities; the proportion was almost 80%. While self-financing was becoming welcome as well as the state budget in big cities, the proportion of both was 43%.

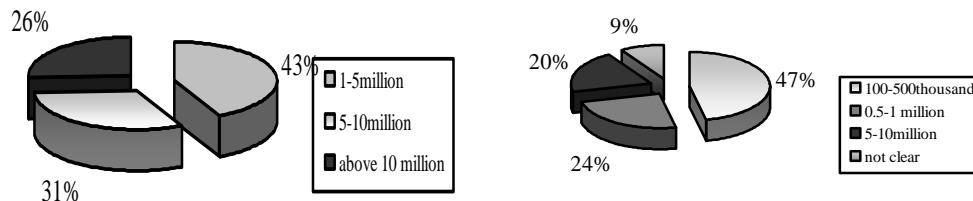


Figure 3: Investment Contrast in Agencies between Big Cities and SM cities

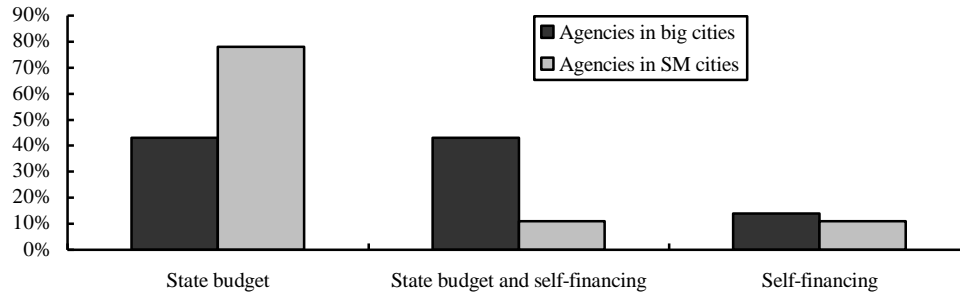


Figure 4: the Contrast of Capital Sources

4.5 The Current Function of E-Government in Construction-Related Agencies

Figure 5 showed the current function of e-Government in construction industry:

- 75% used email system, including 72% agencies in big cities and 78% in SM cities;
- 75% of websites provided external data services to make public access to information, including 86% in big cities and 67% in SM cities. But only 5% information had been updated one time everyday;
- 44% could collaborate in big cities, but only 11% in SM cities;
- 44% had e-bidding in big cities and only 11% in SM cities;
- Only 19% handled office work on-line, including 28% in big cities and 11% in SM cities.

4.6 The Demand Analysis in Building E-Government

Figure 6 shows demand analysis about functions of e-Government system. These aspects should be taken into account in building e-Government system. In these factors, the highest priority of building and operating e-government system could be given to handling office work, and the second is administrative permission.

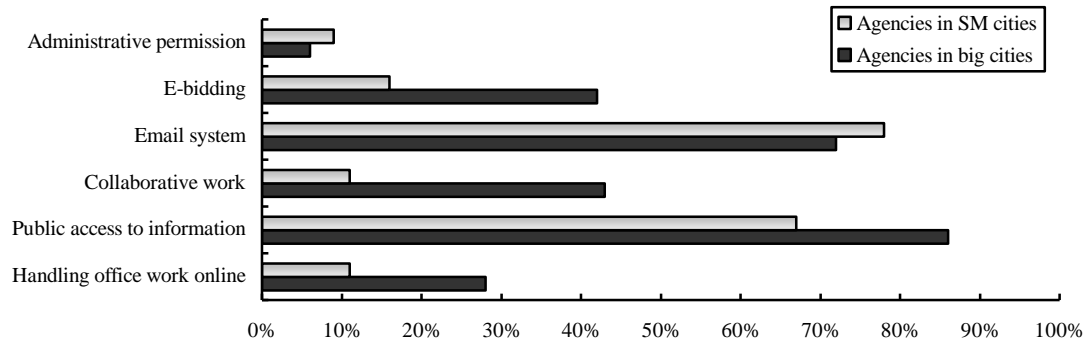


Figure 5: the Current Function of e-Government

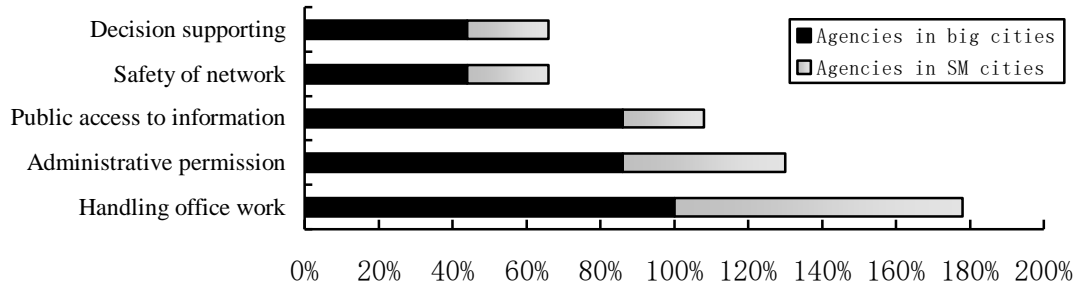


Figure 6: the Demand Analysis of Function of E-Government

4.7 The Difficulty and Barrier

In figure 7, lack of people of complex knowledge is the biggest barrier in building and operating e-Government system in construction-related agencies in both big and SM cities. Lack of money was reported as the second barrier by 69% of respondents. This is predictable. Though the investment in agencies big cities was much more than that of agencies in SM cities (figure 4), there were 72% in big cities to need more money.

5. Conclusions

Based on the above analysis, we get these:

- In general, e-Government in construction-related agencies has made good progress over the past years. E-Government building in construction-related agencies in SM cities lagged behind that in big cities.

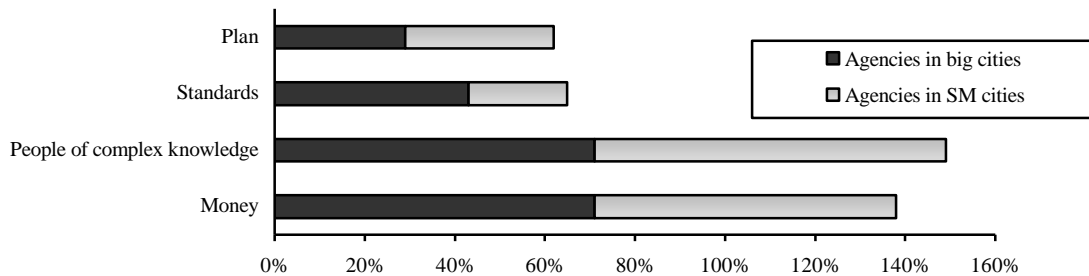


Figure 7: the Difficulty and Barrier

- Computers, software and network provided good base for e-Government. Up to now, 88% have set up LAN, 75% have had email systems, and 94% computers were connected to Internet. The software systems such as OA, document management system and core database became main work tools.
- Part functions of e-Government have come true. 75% of agencies had made public access to information from their websites easily, including 67% in SM cities and 86% in big cities. Only 25% could collaborate including 44% in big cities and 11% in SM cities, and 19% could handle office work on-line.

So, according to the idea of Six Phase in the report of **E-Government in the Asia-Pacific Region** by Clay G. Westcott (Aiming and Shuqing, 2004), e-Government in Chinese construction-related agencies remained

in the second phase. And Compared with New Zealand (the State Services Commission, 2003), e-Government in Chinese construction-related agencies is developing from the first level (web presence) to the second level (interact). In the latter process of building and operating e-Government, we should strengthen these options as follows:

- To impel agencies in counties to build e-Government system by developing e-Governments in province and district.
- E-office work should be taken into considered firstly in the next phase; the others are administration permission, public access to information and safety et al in succession.
- People resources training are necessary. IT training is given to the people of decision making and the domain personnel. Then it is necessary to establish curriculums of IT for construction special students in education institutions, because they will design IT solutions and workflow processes that enable companies to run these functions in the future.
- To increase finance mode. The operation, maintenance and upgrade of e-Government system are long-term projects, which cost much money. It is essential to create one multi- source financing mode which includes government, privacy and foreign investment. The public-private sector partnership mode can be adopted in building and operating e-Government system. This pattern will create a win-win situation for both the government and the private sector.
- Constituting related standards. Standards are critical for interactive applications of data that are web-enabled. The most likely scenario is that standards around E-business will be adopted by the FM/AEC industry (Tapio et al, 2002).
- It is necessary to make plan in building and operating e-Government system.

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7. References

- Rivard H. (2000). "A Survey on the impact of information technology in the Canadian Architecture, Engineering and Construction industry". ITcon, No. 5, pp 37-56.
- Ma Z.L., Gu W.H. (2004). "A Survey on Application of Information Technology in Construction-Related Government Agencies in China", *Innovative application of information technology in construction* .Editors: Xuehui An, Tsinghua University, China, pp. 51-59.
- ErDOS, P. (1983). Professional Mail Surveys, Robert E. Krieger Publishing Company. Malabar, Florida, U.S.A.
- Aiming Wu, Shuqing Wang (2004). "Overseas E-Government", 1st edition, Shanxi people publishing company.
- The State Services Commission (2003). New Zealand E-government Strategy. <http://www.executive.govt.nz/minister/mallard/e-government/index.html>
- Tapio J. Koivu, Lic, Tech. (2002). Future of Product Modeling and Knowledge Sharing in the FM/AEC Industry. <http://www.itcon.org/2002/9>