

Information Services in the United States and China:

A Comparative Study

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ABSTRACT: Information Services belongs to the services industry and can be classified in different ways. A comparasion has been made regarding Information Services in the United States and China. Despite some differences in the composition of their respective Information Services industry, China and the United States have more in common. The 21st Century offers many opportunities for the development of Information Services.

In the 21st century, information has become an essential resource and foundation for the development of society and economy. Information collection, processing, and provision are integrated into an industrial chain by the name of Information Services.

I. An Overview of Information Services

Information Services is to provide value-added information. In fact, to simply provide value-added information is not the only way that Information Services contributes. Information Services also find its way into other industries and realizes its value there. The characteristic of Information Services to interact with a wide range of industries often gives rise to confusion as what Information Services really is.

1. Definition of Information Services in this paper

For a long time, there is much confusion about Information Services. The reasons for such confusion are two-fold. First of all, Information Services is always in a phase of development and growth. Secondly, Information Services is always interterwined with other industries.

Here is a definition about Information Services proposed in this paper. Information Services belongs to the services industry. It is based on the actual or potential information needs of the user, and affords a series of interconnected information collection, processing and provision services.

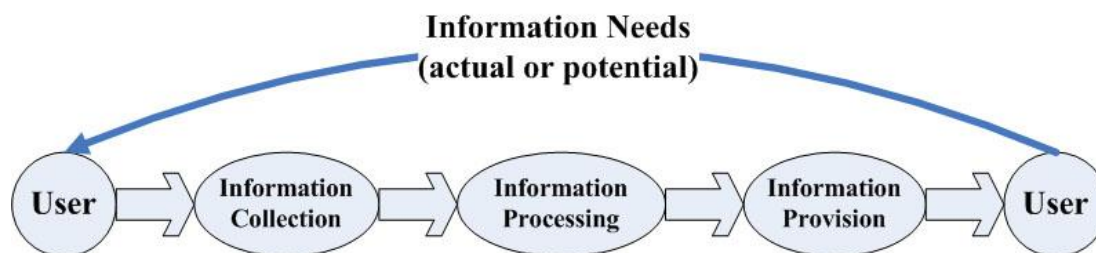


Figure 1: Model of Information Services

2. Classification of Information Services

As a fast-developing discipline, Information Services arouses heated debates over its classification.

2.1 Time-based Classification

Next generation Information Services

Chris Ferguson was the first researcher who discussed the next generation Information Services.[\[1\]](#) He (2000) proposed that next generation Information Services will be based on the combination of Information Services and Information Technology (IT).

In China, next generation Information Services is called modern Information Services. The main viewpoint of modern Information Services is also based on the utilization of Information Technology. Chinese scholars believe that many new models of Information Services have emerged due to the advance of Information Technology. These new models of Information Services have the characteristics of zero distance, low-cost, and reduced consumption.[\[2\]](#)

The typical next generation or modern Information Services combines remote database service, Internet news service, digital library service, etc.

Traditional Information Services

Traditional Information Services has been in existence for a long time. In general, traditional Information Services depends partially on Information Technology. In other words, it utilizes Information Technology for the sole purpose of rendering services better. Traditional Information Services has its own gigantic infrastructure and institutional presence, as embodied in libraries and archives.

2.2 Industry-based Classification

In order to facilitate the collection of Information Services statistics, a common practice is to classify Information Services by industry. For instant, "marketing

consulting service", "data processing service" and "publishing services" are often mentioned in Information Services. However, due to the inconsistency of industrial classification between different countries, there lacks a standard scheme to classify Information Services by industry. Consequently, it is hard to determine which services is Information Services.

2.3. Process-based Classification

In 1988, Michael Porter and Victor Millar modelled "supply chains",^[3] and Jane Klobas (1998) further clarified it.^[4] Figure 2 was showed in Jane's paper. It means that any organization can be modelled as having a "supply chain" that reflects the need to seek raw materials from a supplier, to make a product or service that is at the core of the organization's business, and to deliver products or services to customers.

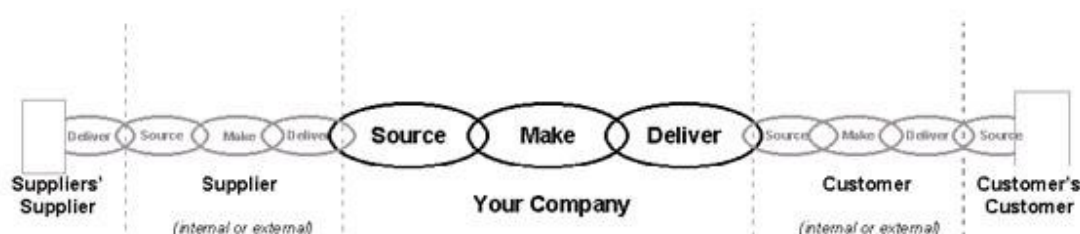


Figure 2: A supply chain

"Supply chain" model is also applicable in Information Services. The chain includes information collection (as "Source" in Figure 2), information processing (as "Make"), and information provision (as "Deliver").

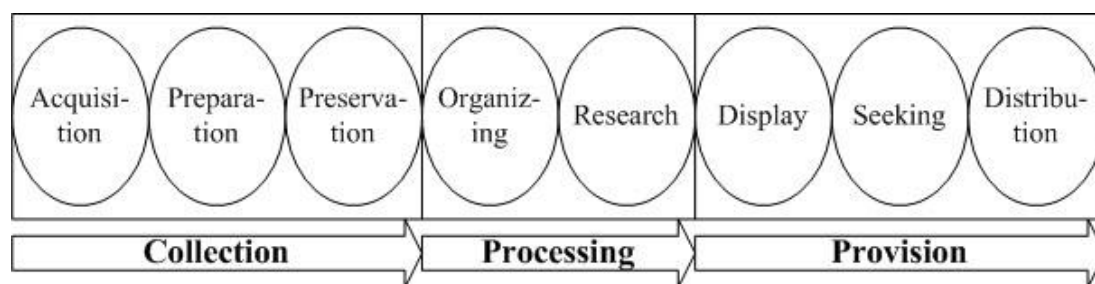


Figure 3: Information Services process

In the above model, the collection phase can be further broken down to acquisition, preparation and preservation, the processing phase to organizing and research, and the provision phase to display, seeking and distribution.

Information Services is divided into three phases according to the workflow, but it does not mean that an information service can only comprise of one of these three phases. It just means that a service must have these entire three phases in order to be qualified as Information Services.

3. Components of Information Services

The components of Information Services mainly refer to the conditions and circumstances through which an information provider provides information to users. Figure 4 shows some main components in Information Services.

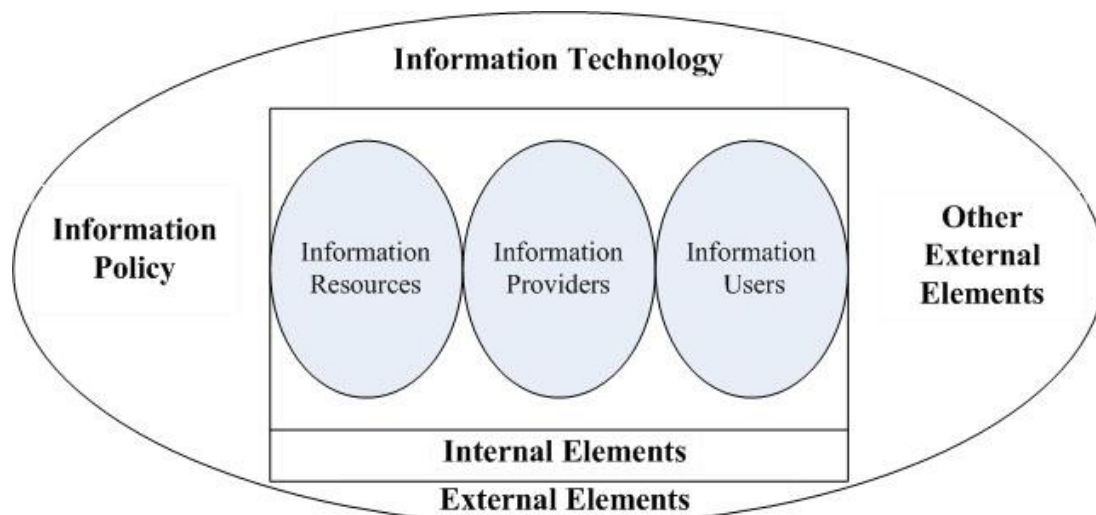


Figure 4: Components of Information Services

3.1. Internal components

Internal components are required for a complete Information Services. Information Services cannot operate if any component is missing. They include information resources, information providers, and information users.

3.2. External components

External components are not required elements of Information Services, but these components will have an impact on Information Services. They include Information Technology, information policy, information market, and information evaluation.

II. Information Services in the United States

The United States is the world's most developed country, and its robust Information Technology and rich managing experience constitute the basis of its Information Services. The United States is the world's most developed country, and its robust Information Technology and rich managing experience constitute the basis of its Information Services. The United States is the world's most developed country, and its robust Information Technology and rich managing experience constitute the basis of its Information Services.

1. Basic situation of Information Services in the U.S.

In the United States, there is not a specific industrial classification of Information Services, but 'Information' section is very important in NAICS (North American Industry Classification System, U.S. Census Bureau).

Table 1: Information section in NAICS

51	Information	
511	Publishing Industries (except Internet)	
5111	Newspaper, Periodical, Book, and Directory Publishers	
5112	Software Publishers	
512	Motion Picture and Sound Recording Industries	
5121	Motion Picture and Video Industries	
5122	Sound Recording Industries	
515	Broadcasting (except Internet)	
5151	Radio and Television Broadcasting	
5152	Cable and Other Subscription Programming	
517	Telecommunications	
5171	Wired Telecommunications Carriers	
5172	Wireless Telecommunications Carriers (except Satellite)	
5174	Satellite Telecommunications	
5179	Other Telecommunications	
518	Data Processing, Hosting and Related Services	
5182	Data Processing, Hosting, and Related Services	
519	Other Information Services	
5191	Other Information Services	
51911	News Syndicates	
51912	Libraries and Archives	
51913	Internet Publishing and Broadcasting and Web Search Portals	
51919	All Other Information Services	

According to the definition of Information Services and NAICS, this table shows the status of Information Services in the United States:

- Information Services belongs to Services Industries.
- Most Information Services are at the intersection of information industry and service industry. These services are "Newspaper, Periodical, Book, and Directory Publishers", "Data Processing, Hosting, and Related Services", etc.
- Some Information Services are not at the intersection of information industry and service industry. For example, "Marketing Consulting Services" is classified in "Professional, Scientific, and Technical Services".
- Not all services at the intersection of information industry and service industry are Information Services. Just those engaging in the entire process of information collection, processing and provision can be called Information Services.

Based on such analysis, Information Services in the United States can be illustrated in Figure 5 and Table 2.

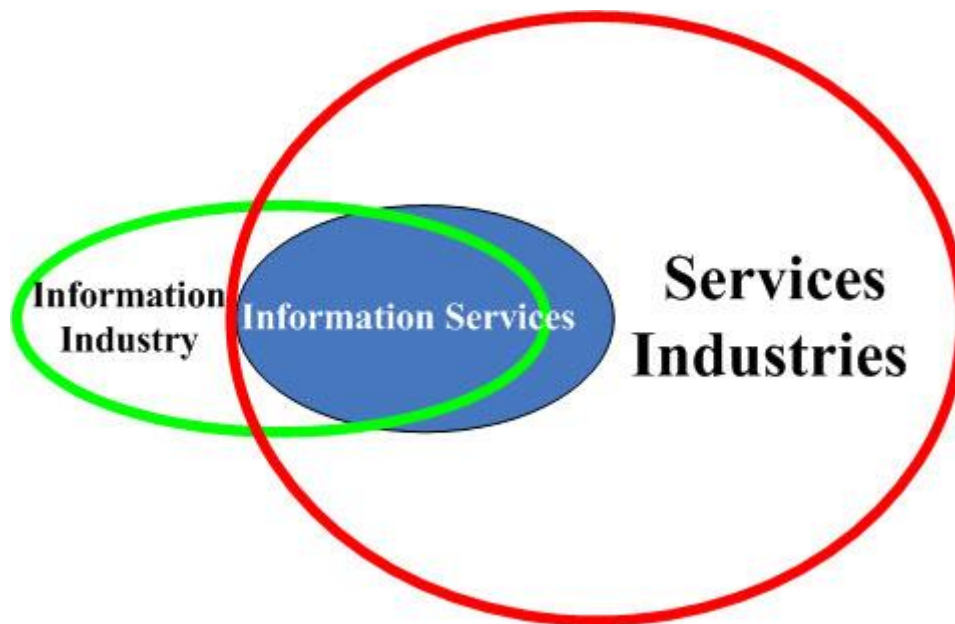


Figure 5: Information Services in the U.S. industry

Table 2: Information Services in the United States (2002*1)

Code	Category	Establishments	Revenue (\$1,000)	Annual payroll (\$1,000)	Paid employees
5111	Newspaper, Periodical, Book, and Directory Publishers	22,334	138,710,521	30,745,775	732,877
5121	Motion Picture and Video Industries	19,074	62,926,611	10,352,661	271,225
5122	Sound Recording Industries	3,384	15,323,757	2,246,456	31,923
5151	Radio and Television Broadcasting	8,851	48,589,052	11,590,880	252,221
5182	Data Processing, Hosting, and Related Services	13,769	53,089,145	21,267,178	434,276
5191	Other Information Services				
51911	News syndicates	535	1,843,668	586,683	10,578
51912	Libraries & archives	2,680	1,649,136	704,681	33,359
51611	Internet publishing & broadcasting	2,057	6,363,468	2,346,256	40,021
51919	All other Information Services	257	1,408,501	413,686	13,822
	Total	72,941	329,903,859	80,254,256	1,859,442
xxxx	Information Services in other services industries	N/A*2	N/A	N/A	N/A

*1: This paper chooses year 2002 because the census data are relatively complete in that year.

*2: N/A means there are no accurate statistics from NAICS.

From the Information Services statistics of the United States (excluding the Information Services in other services industries) in 2002, the establishments were 73,000, the revenue was 330 billion dollars, the annual payroll was more than 80 billion dollars, and the paid employees were more than 1.8 million.

2. The characteristics of Information Services in the U.S.

There are many characteristics of American Information Services. Here are some of the characteristics that are most relevant to this paper.

2.1 Highly developed and extensive use of Information Technology

The United States is the world's largest Information Technology producer and consumer as well. At present, the majority of global top 10 Information Technology companies are in the United States. These huge IT companies, such as IBM, Intel, Microsoft, Cisco, and Motorola, are dominating the development of computer hardware, software and telecommunication.

The powerful Information Technology spurs the development of Information Services. In the United States, Information Services providers have already used all kinds of telecommunication networks to provide Information Services. Wide application of Information Technology has drastically improved operation and reduced cost. It can be said that Information Technology drives the development of Information Services in the United States.

2.2. Fine division in Information Services

In the United States, Information Services has fine division. For example, "Data Processing, Hosting, and Related Services" (51821 in NAICS) is subdivided into 25 services in *Census Bureau Information Subject Series (Product Lines: 2002)*.[\[5\]](#)

- Collocation services
- Video and audio streaming services
- Other IT infrastructure provisioning services
- Information and document transformation services
- Internet telecommunication services
- IT technical consulting services
- Custom computer application design and development services
- Computer network design and development services
- Computer systems design, development, and integration services
- Web site hosting services
- Application service provisioning
- Business process management services
- Data storage services
- Data management services
- IT infrastructure (computer) and network management services
- IT technical support services
- Internet access services
- Resale of computer hardware and software
- Rental and leasing of computer hardware
- IT related training services
- Data analysis services
- Computer staff augmentation services
- Management consulting services
- Merchandise sales

- All other receipts

2.3. More prevalent outsourcing in Information Services

Outsourcing (or contracting out) in the United States is not new. It is a business decision that is often made to lower costs or focus on core competences. Outsourcing is often defined as the delegation of non-core operations or jobs from internal production within a business to an external entity (i.e., a subcontractor) that specializes in that operation.[\[6\]](#)

In the United States, more and more global companies have used outsourcing in their services.

Nowadays, outsourcing in the United States has been switched to offshoring in some Information Services. Offshoring is a type of outsourcing that transfers some non-core operations to a low-wage country. Call center services is a typical information service in the United States to be offshored. Many companies, such as American Express, Dell, and T-mobile, have established their call centers in India since mid-1990s.[\[7\]](#)

III. Information Services in China

Although the statistical classification of Information Services does not exist in China, Chinese Information Services has been developing rapidly.

1. Basic situation of Information Services in China

In China, there are lots of researches on the definition and classification of Information Services, but no consensus was reached until the present. In 1992, CIITA (China Information Industry Trade Association) did a wide survey among establishments that provide Information Services. According to the survey, CIITA classified Information Services into 6 parts. And this classification was used for many years till 2002.[\[8\]](#) Here is the classification:

- information provision
- information processing
- software development and services
- systems integration services
- consulting
- other Information Services

In 2002, the Chinese government did the Second Basic Establishments Survey. In that survey, the classification of industry was based on "Industrial Classification and Codes for National Economic Activities (CSIC) 1994". Unfortunately, there is not a clear classification of Information Services in "CSIC 1994". However, in a follow-up of the statistical analysis published by the National Bureau of Statistics, there was a

special chapter about Information Services.[\[9\]](#) In that chapter, Information Services was divided into 8 categories:

- social survey
- information processing
- information provision
- telecommunications services
- consulting
- brokerage
- public Information Services
- other Information Services

This was the first time that the Chinese government adopted an official classification about Information Services. It is a pity that there were not enough data to reflect the situation of Chinese Information Services in that survey.

In 2004, the Chinese government did the first Economic Census. In this census, a plenty of data can be used for analysis, but the classification of industry was based on "CSIC 2002". There are some differences between "CSIC 1994" and "CSIC 2002" in Information Services, and they are showed in Table 3.

According to the first Economic Census, which was based on "CSIC 2002", Table 4 shows the statistical data about Chinese Information Services.

Table 3: The differences between Two 'CSIC' in Information Services

	Information Services	Based on CSIC 1994	Based on CSIC 2002
1	social Survey	social Survey(8224)	Consulting and Survey(7430)
2	information processing	Computer services(8310)	Computer System services(6110)
		Data processing(8320)	Data processing(6120)
		Database services(8330)	Internet Information Services(6020)
3	information provision	Consulting and advertisement(8210)	Advertisement(7440)
		Publish(9020)	News publish(8800)
4	telecommunications services	Telecommunication(6020)	Telecommunication(6010)
5	consulting services	Impartiality(8221)	Law counseling(7420)
		law office(8222)	
6	brokerage	Economic and commercial agent(6500)	Trade brokers and agents(6380)
		Securities economy and education(6860)	Securities brokerage and trading (6920)
			Securities Analysis and Advisory(6940)
		Economic and real estate agent(7400)	Real estate services (7230)
		Deputy Arts and Culture(9080)	Acting arts and culture brokers (9080)
	the promotion of technical exchanges(9370)	Scientific and technological exchanges and Services Promotion(7700)	
7	public Information Services	Library (9040)	Library and Archives (9030)
		The cultural industry(9050)	Mass cultural activities(9070)
8	other Information Services	Other consulting industry(8290)	— *

* Other Information Services are included in "Consulting and Survey (7430)" in CSIC 2002.

Table 4: Specific Information Services in China (2004*1) \$1= £8.27

	Information Services (based on CSIC 2002)	Establish- ments	Revenue		Paid employees	Annual payroll	
			¥(10,000)	US\$ (1,000,000)		¥(10,000)	US\$ (1,000,000)
1	Consulting and Survey(7430)	66,803	6746800	8,158.16	656500	1211000	1,464.33
2	Computer System services(6110)	7,936	4616900	5,582.71	123600	449200	543.17
	Data processing(6120)	992	246900	298.55	20100	50900	61.55
	Internet Information Services(6020)	6,472	1512600	1,829.02	89400	176900	213.91
3	Advertisement(7440)	38,882	7925900	9,583.92	362100	527200	637.48
	News publish(8800)	5,971	5862000	7,088.27	278100	583300	705.32
4	Telecommunication(6010)	28,454	55484200	67,090.93	1528000	3422900	4,138.94
5	Law counseling(7420)	22,345	1585400	1,917.05	195300	357100	431.80
	Trade brokers and agents(6380)	8,319	N/A*	N/A	84700	N/A	N/A
	Securities brokerage and trading (6920)	3,450	N/A	N/A	94300	N/A	N/A
	Securities Analysis and Advisory(6940)	119	N/A	N/A	3900	N/A	N/A
6	Real estate services (7230)	31,883	N/A	N/A	256600	N/A	N/A
	Acting arts and culture brokers (9080)	1,152	70900	85.73	9600	9000	10.88
	Scientific and technological exchanges and Services Promotion(7700)	70,207	5041600	6,096.25	755500	457700	553.45
7	Library and Archives (9030)	5,038	2400	2.90	74800	500	0.60
	Mass cultural activities(9070)	16,853	30100	36.40	108100	7700	9.31
	Total	314,876	89,125,700	107,770	4,640,600	7,253,400	8,771

*1: This paper chose the year of 2004 because the census data in that year are

relatively complete.

*2: N/A means that National Bureau of Statistics did not provide data.

2. The characteristics of Information Services in China

Redundant construction

In China, the government did not have a macro-control in the field of Information Services. All institutions pursue the model of "large and comprehensive" or "small but complete". For example, there are many companies developing "periodical database service" in China. Each company has its own scanning, recording and distribution system, but their information resources are the same.

Simple processing

China's Information Services are based on simple processing. Lack of strong demand for information, coupled with financial problems, resulted in China's Information Services provider laying more emphasis on simple processing. For example, "information survey services", "data entry services", and "periodicals database service" are low value-added and slow-developed services in Information Services domain. As China's Information Services is at a simple processing stage, it is very hard to attract high-level talents. As a result, Information has to be handled by lower-level staff. It has become a vicious circle.[\[10\]](#)

Uneven development

China's Information Services has geographical disparities, owing to the imbalance of economic development in different parts. The Eastern coastal areas and some big cities, such as Beijing, Shanghai and Guangzhou, have more information resources and better information infrastructure. Their Information Services are better than central and Western inland regions.

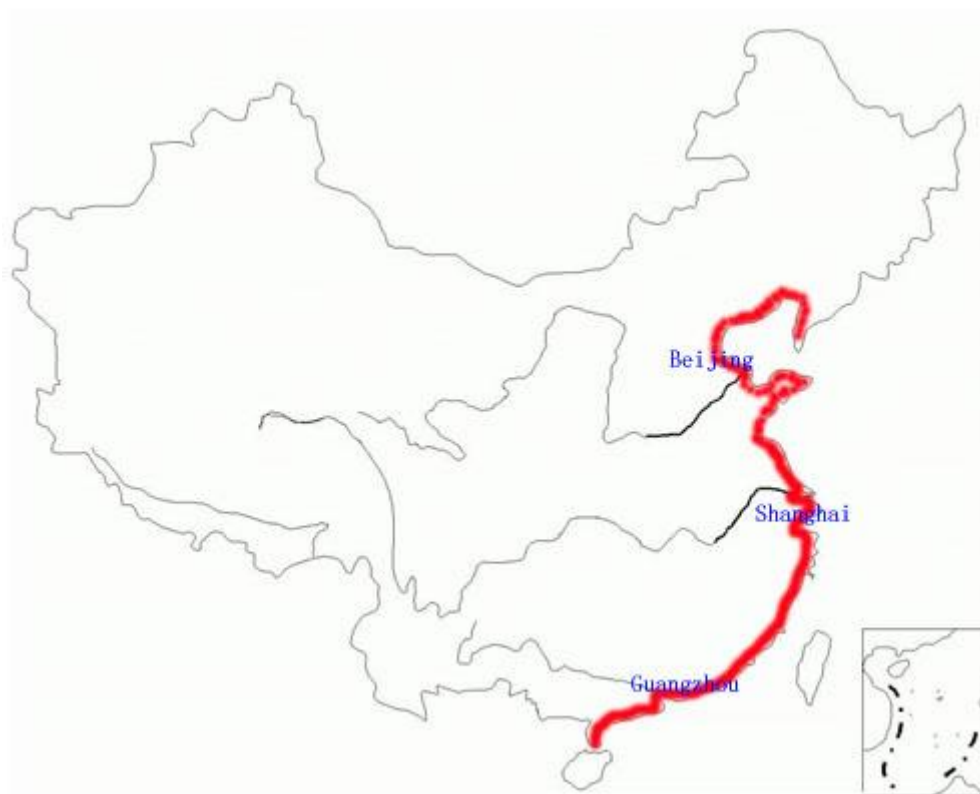


Figure 6: The developed areas of Information Services in China

IV. Differences between the U.S. and China in Information Services and Chinese improvement

1. Differences between U.S. and China in Information Services

The above analysis demonstrates that there are four significant differences between the United States and China in Information Services.

First of all, Information Technology has been used more and more in American Information Services. In particular, the development of round-the-clock telecommunication network makes Information Services more powerful in the United States. In comparison, China's Information Services is mainly at the simple processing stage. The under-developed Information Technology is an obstacle for China's Information Services.

Secondly, high expenses of human resources and office space constrain the development of Information Services in the United States. In contrast, that is the strength of China. Cost of staffing in China is only 10% of that in the United States. China also has extremely low cost in real estate and power supplies. All of these are China's advantage in Information Services.

Thirdly, the United States has a large number of Information Services institutions. They compete with each other on saving resources. On the other hand, China's

Information Services institutions are unevenly developed. All of them pursue a "large and comprehensive" or "small but complete" model. And the result is waste of resources.

Finally, Information Services is a well defined industry in the United States, which allows for outsourcing. China does not even have a specific industrial classification of Information Services.

2. China's Improvements on Information Services

Develop information infrastructure

To develop Information Services, the Chinese government put more emphasis on information infrastructure.

By the end of 2005, the total capacity of telephone exchanges used reached 469.54 million, and real equipment rate was 74.6%. Mobile telephone exchange capacity reached 482.83 million, and real equipment rate was 81.5%. Cable is the main physical media carrier for telecommunications transmission, the total length of which reached 4.05 million kilometers.

AM, shortwave, and FM radio, and television interchanges were more than 70,000. A total of 39 transponders on 9 leased satellites transmitted programs, and satellite TV stations reached 1.18 million. National radio and television transmission routes were 2,420,000 kilometers in length.

The total number of Internet users in China reached 111 million. There were 49.5 million computers connected to Internet. The international bandwidth of Internet reached 136,106 Megabites. Chinese mainland had 74,391,296 IP addresses, ranking the third in the world.

Set up more Information Services System

In recent years, the Chinese Government have invested more than 2.5 billion dollars in economy, science and technology, statistics, banking, post and telecommunications, electricity, railways, meteorology, civil aviation and national population Information Services system. Just in scientific and technological domain alone, the central government, local provinces, and some major cities have all contributed to the establishment of scientific and technological Information Services institutions. The total number was over 400 in peak.[\[11\]](#)

Pay more attentions on Information Services

The Chinese government has paid more and more attentions to Information Services. Many plans were drawn and interim regulations issued. For example, the Chinese

government has released the *Plan of Information Services Development in the Next 10 Years* and the *Interim Regulation on Government Information Resources Management*.

V. Conclusion

Despite some differences in the composition of their respective Information Services industry, China and the United States have more in common. The 21st Century offers many opportunities for the development of Information Services. China should embrace the opportunities and utilize the Information Services to benefit the society.

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