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Progress of e-development in China since 1998

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ABSTRACT

In this paper, a holistic analytical framework for tracing and understanding the progress of e-development is developed and adopted in an empirical case study of China's e-development since 1998. In particular, the progress is analyzed systematically by benchmarking various ICT infrastructure and e-devices, the composition of Internet users, and the key dimensions of e-government, e-working, e-commerce, and e-networking. In addition, the questions of whether the geographical digital divide in the country has been narrowed is examined. Our findings show that (1) China has made noticeable progress in the e-development since 1998; yet, progress varied in different dimensions; (2) based on the overall performance, 2004 can be considered as the watershed for China to move from the formative stage to the developmental stage; (3) during the e-development, digital disparities in China have dramatically decreased at the provincial level, however, the urban-rural digital gap widened. We suggest that other than promoting affordable ICT possession, the wider and more diversified e-applications for different walks of life will be important for China to move towards the mature stage.

1. Introduction

Information and communication technology (ICT) has been regarded as one of the most powerful forces in shaping the 21st century (The Okinawa Charter of the G8 in July 2000). Nowadays we are living in an era of unprecedented technological change both in terms of extent and the speed of change. The widespread adoption of a great number of e-devices (e.g., personal computers and mobile phones) by people from almost all walks of life and a multitude of applications in almost every aspect of our daily life has witnessed the emergence of the e-society (Loo, 2012). In previous research, the e-society is also referred to as the cyber-society, knowledge economy, information society, networked society, and telematics society (Batty & Barr, 1994; Castells, 2011; Dodge & Kitchin, 2001; Drucker, 2011; Graham & Marvin, 2002; Loo, 2012). Although these terms have slightly different emphases, they are all used to describe key aspects of development brought about by ICT.

It should be noted that the e-society is not a phenomenon that suddenly "appears"; instead, it evolves across different domains through different stages (Loo, 2012). Beyond the fuzziness of observations, concepts, and representations (e.g., the computers versus the mobile phones), there is a broad consensus in scholarly, industrial, and political circles on the need for public policies to guide this e-development (that is, the progress towards a mature e-society) to ensure that the potential benefits of ICT are available to all people (Menou & Taylor, 2006). As the World Summits of the Information Society (WSIS) highlighted, "Governments have a leading role in developing and implementing comprehensive, forward-looking and sustainable national e-strategies; the private sector and civil society, in dialogue with governments, have an important consultative role to play in devising national e-strategies" (ITU, 2005, Plan of action, 3a, p.27). Therefore, it is crucial to develop a holistic analytical framework for tracing and understanding

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the characteristics and different stages of e-development, which allows researchers and policy-makers to evaluate the readiness of a community towards a more mature stage of an e-society and to make the best decisions of promoting the e-development (Loo, 2012; Menou & Taylor, 2006).

The need to develop such a framework to benchmark and assess e-development was emphasized in two WSIS documents, namely, the Geneva Plan of Action in 2003 and the Tunis Agenda in 2005 (ITU, 2005). Both documents called for international and national performance evaluation and benchmarking tools. With this need, some well-known international organizations have been collecting and disseminating ICT statistics, such as "Measuring the Information Society" by the International Telecommunication Union (ITU, 2009) and "Guide for Measuring the Information Society" by the Organization for Economic Co-operation and Development (OECD, 2011). Overall, the analytical framework used in both reports mainly focused on ICT availability to give an idea about the state of each individual economy and the overall world situation. Given the fundamental role of ICT infrastructure in connecting computers and allowing access to the Internet possible in the first place, ICT readiness indicators have also been more used in some scholarly research (Menou & Taylor, 2006; Ricci, 2000; Song & Wang, 2012).

However, it is important to note that, as a multi-dimensional phenomenon beyond technological "achievements", the e-society is characterized as the use of ICT for all major domains of people's daily life including entertainment, working, socializing activities that fulfill various economic, social, and political obligations (Loo, 2012). Thus, e-development should not be measured and understood as limited mainly to advances in e-technologies (ICT infrastructure, e-device and e-applications) (Castells, 2011; Kellerman, 2016; Loo, 2012). Preferably, the analytical framework should also capture the impacts of efficient and effective ICT use on people's lifestyle. For instance, who are active users? Is the digital divide narrowing from the socioeconomic perspective? How is a person's daily life affected? How have different domains of the e-society evolved over time? Answers to these questions are core to the concept of the e-society and thus, represents a better understanding of the process of e-development.

To address these questions, this study aims to develop a holistic analytical framework for tracing and understanding the development of an e-society. Moreover, we apply this framework to examine an empirical case study of China. Apart from the theoretical contributions, this study also contributes to a better understanding of what has taken place in China with various progresses in different dimensions of the e-society since 1998. As the largest ICT market in the world, a systematic review of China's progress in e-development is much needed.[1] First, partly because of its largest population, China already has the largest number of Internet users in the world since 2008. Despite a growing interest in China's ICT development in the media, there is inadequate systematic research on tracing and understanding the e-development in China (Atsmon & Magni, 2010; Chu, 2008; Loo, 2003b). Second, it has been widely recognized that the ICT development in China has been heavily shaped by the government policy (Harwit, 2005; Loo, 2003b; Loo & Ngan, 2012; Ward & Zheng, 2016; Wu, 1996; Zhen, Wang, & Wei, 2015; Zheng & Ward, 2011). This analysis further elaborates how government policy evolves and influences the e-development at different stages in China. Lastly, conceptualized as "the gap between individuals, households, business and geographic areas at different socio-economic levels with regard both to their opportunities to access ICT and to their use of the Internet for a wide variety of activities" (OECD, 2001, p.5), the digital divide has been a key issue faced by many developing countries (Liu, 2016; Loo & Ngan, 2012; Srinuan, Srinuan, & Bohlin, 2012; Xia & Lu, 2008). From a geographical perspective, the digital divide at the provincial level and between urban and rural areas in China are further examined to show whether it is widening or narrowing during the e-development. This analysis of Chinese experience may also serve as useful reference for other developing countries in their e-development.

2. Analytical framework

Up to date, there is no single comprehensive analytical framework of the e-society. Since 2009, ITU issued its annual report on "Measuring the Information Society" which ranks economies in a league table. In particular, the ICT Development Index (IDI) was constructed to measure the overall level of e-development. The IDI combines three sub-components of the index, namely, ICT infrastructure and access, ICT use and intensity of use, and ICT skills and the capacity to use ICT effectively, into one single statistical value (ITU, 2009). In the same manner, the Organization for Economic Co-operation and Development (OECD) publishes its report on "Guide for Measuring the Information Society", in which ICT infrastructure and ICT-related products (i.e., e-devices and service) constitute the major indicators (OECD, 2011). However, in both well-known reports, the impact of ICT use on people's lifestyle is almost missing. In scholarly research, in spite of the measurement of ICT use in specific fields such as e-commerce (Delone & Mclean, 2004; Xing, Ye, & Kui, 2011) and e-government (Palvia & Sharma, 2007), there is limited empirical research that systematically traces e-development in all major dimensions over time.

In the current study, we develop a holistic analytical framework for tracing and understanding the progress of e-development comprising the technological, individual, and social aspects (as shown in Fig. 1). In particular, compared to the technical aspect which focuses on the e-technologies, the latter two aspects capture the pervasive impact of e-technologies on different aspects of the society. The advances in technology have transformed the ways in which people process information. New e-devices become more affordable and user-friendly. They enable a variety of e-activities to be carried out for an individual and empower everyone in the society to become an active user. Generally, it is perceived that an individual's life will have the political, economic, and social spheres, which are all inter-related. And in each sphere, there are popular e-activities that have been considered in this study.[2] In

[1] In this study, China refers to Mainland China and data of Taiwan, Hong Kong, and Macau are not included.

[2] In this study, we have not encompassed all spheres of every individual's everyday life (for example, e-crime, e-education, e-game, and e-news). Yet, it is hoped that this study will provide a first glimpse into the pervasive influence of e-technologies on these important spheres of an individual's life.